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The Health of the People in a Year of Depression*

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IT is the duty and pleasure of your retiring President to report first on the state of the Association. We have closed a very successful year. On the first of September, there were 4,742 members and Fellows on our books, representing professional health workers in every state of the union, every province in the Dominion, and the two neighboring republics of Cuba and Mexico, to our south. In spite of hard economic conditions, the like of which none of us can remember, our membership has held up to within 25 of the number on our rolls at the last Annual Meeting when we reached our maximum. We have elected or reinstated 612 members and Fellows during the year, and I am particularly pleased to report that we now have 69 Life Members. I hope this movement which means so much to the Association will continue to grow.

Our finances likewise are in good shape. Our income from membership dues, from the JOURNAL and other publications, and from the Annual Meeting this year can now be safely estimated as in excess of $71,000. These are the items of fixed income and show a decline of about $22,000 as compared with last year. Our contingent income which is for surveys, grants from Foundations and others, for specific purposes, has decreased by about $25,000 this year. Our total income will, therefore, be about $47,000 less than last year. But to offset that, we have been very careful to cut our expenses and there is every indication that we shall close the calendar year with a small surplus. Most other voluntary organizations, I am sorry to say, are running

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into larger or smaller deficits. Thanks to the excellent management of our Executive Secretary and the guidance of our Treasurer, we have put our resources where they will do the most good. Great credit is due the staff who have accepted serious salary reductions without murmur and have, under conditions which must have been very difficult, carried on their work with all the energy and enthusiasm which have always characterized them and which have made the Association the great force for good that it is.

I report to you also a year of real achievement in the promotion of the public health. The four standing committees of the Association have functioned well under trying conditions. The Committee on Administrative Practice has continued its operations, spreading its gospel of high standards and efficient health service throughout the land. Although the Committee on Fellowship and Membership was very much hampered by lack of financial support, it has, as I have already said, produced a record of which we can be proud. I am particularly pleased to refer to the splendid work of the Committee on Meetings and Publications. You must all of you have been greatly impressed with the extent and character of the program which the committee has prepared. Some 300 papers have been provided, covering every phase of the public health problem and fully 100 of them are by speakers who have never before appeared on our programs. It is in this way that the Association profits from new blood and extends its influence into new areas. The Committee on Research and Standards, in spite of a far-reaching and constructive program of work has, unfortunately, been compelled to go slowly. I wish we could have put larger resources at the disposal of this excellent committee, but the condition of our budget made that impossible. Nevertheless, I am convinced that the four committees are functioning well. Their activities add to the knowledge and practice of good public health work; stimulate the membership to greater achievement; and increase the technical efficiency of all of us.

I cannot, however, leave this subject without referring to a few projects which to my mind are of preëminent importance. The first is the Health Conservation Contest which we have been conducting in conjunction with the Chamber of Commerce of the United States. This continues to be the most dramatic and practical service of the Association. The contest now reaches directly over 260 cities in 45 states with an aggregate population of close to 30 millions, or about one-quarter of the total population of the country. These cities have directly profited by the knowledge gained through the surveys, by the advice and guidance of our field staff, and by the widespread dis-

semination of good public health information in the community. Indirectly, many more cities with large populations have been favorably affected; for it is impossible to conduct a contest of the magnitude of ours without having its influence spread far beyond the limits of the cities enrolled.

The record of the contest is replete with valuable results. It is significant that the cities enrolled take part in the contest year after year and show improvement in their consecutive scores. More than 90 per cent of all the cities which were entered more than once, received higher scores last year than in any preceding year, in spite of the fact that 50 points were taken off the possible maximum. The average score among the 36 cities which won or received honorable mention in 1931 was approximately 88 per cent of our reasonable standards, and the average expenditure to attain this was only $1.71 per capita. The average score for all cities in the contest for 1931 was 650, as compared with an average score of 542 for 1929. Probably the most important result is the very real interest in the public health movement which the contest has evoked among prominent business men of the country. From 2,000 to 3,000 such leaders have become actively interested in community health and have in this way become allies and supporters of local health officers. Our contest has convinced these influential citizens that by improving the public health, they can at the same time benefit the financial standing of their communities. The Health Contest has passed the experimental stage and we may all look forward to its expansion until it covers virtually the whole country.

The second activity which, I believe, calls for special mention is the publication of the revised edition of *Community Health Organization*. This was prepared under the supervision of the Sub-Committee on Community Health Organization of the Committee on Administrative Practice and has been most carefully edited by Prof. Ira V. Hiscock. We are grateful to the Commonwealth Fund for doing a beautiful printing job and for distributing the volume. Every health officer in the country now has available to him in brief compass a well written and practical treatise on the most approved health practices. The problems of personnel, of administration, of budgeting, are all considered clearly and soundly. It is altogether a monumental work. I hope it will find its way into the hands of every health officer, not only in the United States and Canada, but in all other countries where public health administration is conducted along similar lines. It will certainly help to raise standards of technical health service to a very high level.

I wish it were possible to refer in the same detail to other valuable activities of the Association, such as the revision of the *Appraisal Form for Rural Health Work* made by Dr. Bishop's Committee, the revision of our *Standard Methods for the Examination of Water and Sewage* made by our Committee on Standard Methods in coöperation with the American Water Works Association, the operations of the sub-Committee on Training and Personnel under the leadership of Professor Turner, the excellent work done by our large Western Branch and the organization of the Southern Branch. I am compelled, however, to limit myself to the high spots and will ask those who are associated with other valuable services to forgive me. I can only say that in turning the Association over to Dr. Ferrell I am delighted to report that all is well. The Association has never been better organized, or possessed a more enthusiastic membership, or had a clearer conception of its service, or awaited a more brilliant future.

THE HEALTH OF THE COUNTRY

It is particularly gratifying to note the very favorable health conditions that have prevailed throughout the United States and Canada during the last year. By and large, the health of the people as measured by the reports of sickness and deaths has never been better, in spite of the fact that this is the third year of serious economic depression. With possibly 10 millions unemployed and with the general state of mind clouded with many perplexities and uncertainties, the health of our communities has apparently stood up well.

Sickness and death rates are either the lowest in the history of the country or very close to it. Early in the year, the Surgeon-General of the U. S. Public Health Service reported that the death rate in 82 large cities had been 11.8 per 1,000 in 1931, as compared with 11.9 the year before. Since then, morbidity and mortality have continued each month at an extremely low level. For the first 37 weeks of 1932, General Cumming reports a death rate of 11.2 for 85 large cities, as compared with 12.1 for the same period in 1931. The industrial life insurance companies, whose experience is also indicative of what is transpiring in the general population, are likewise reporting the lowest mortality rates among their policy holders. In the largest of these companies, the cumulative experience up to the end of September this year was about 3 per cent lower than last year which was an excellent health year. The best feature of this picture is the fact that there is no evidence as yet that the depression has adversely affected the physical resistance of the people.

Infant mortality, deaths from the communicable diseases of chil-

dren, tuberculosis, and pneumonia—all of which we have in the past, either rightfully or wrongfully, associated with the level of the standard of living—have continued to decline this year. Tuberculosis and pneumonia are remarkable in this regard, showing rates respectively about 7 and 17 per cent lower than last year. I should, however, point out that our records throw no light on the mental health of the people which must be anything but good. Nor can I avoid the fear that, should present conditions continue, we will soon become aware of the consequences of malnutrition of children in terms of disease and mortality records. To date, I am glad to say there are only a few authentic observations pointing in this direction. The available facts, especially on mortality, may give all of us who are concerned with the public health, encouragement, satisfaction and pride.

I have speculated as to what underlies the satisfactory health picture, and will consider briefly some of the factors which are probably involved in the situation. There is first the favorable meteorological conditions which have prevailed. The weather was propitious both last winter and this summer, and as a result many people were able to lead an active outdoor life. In addition, there were no serious epidemics of disease. Influenza was less widespread this year than it has been recently; the cases that occurred were much less virulent and resulted in fewer attacks of pneumonia and other fatal complications. I would mention also changes in the mode of life which have been forced on many people during the depression and which probably contributed to better health habits. There has undoubtedly been less over-drinking and over-feeding. People have been less exposed to the hazards of machinery. Unemployment, much against their will, has brought them rest and leisure, more sunshine, and opportunities for outdoor exercise, all of which play a part in keeping people well.

But I am inclined to believe that the most important factor in the situation is the continued and effective functioning of the health departments, the medical profession, and the social service agencies. These deserve our highest praise. They have all carried their heavy burdens cheerfully and have performed their tasks in a highly efficient manner. The organizations which have grown up during the last 30 years, the health departments, the medical clinics and the hospitals, have waited for just this opportunity to demonstrate their usefulness. When people could no longer pay for private medical care, they received much free treatment from doctors. Everywhere they found the public departments of health, the private welfare socie-

ties, the hospitals and dispensaries ready and happy to serve them. I have no doubt at all that these agencies have helped to keep up the public morale, have carried on essential work and have tided many a family over a very difficult period. Especially valuable has been the educational work they have conducted for many years prior to the depression and which is now serving as a reservoir of knowledge upon which the public continues to draw. I can report with enthusiasm on the operations of the public health and social agencies during the last few years.

But my enthusiasm must be somewhat tempered. I realize that these organizations have gone through a very trying time. Under pressure of the economic stringency, states and cities and philanthropic societies have been forced to give very serious consideration to economies in their budgets and many health activities have suffered in consequence.

RECENT REDUCTIONS IN HEALTH BUDGETS

At the beginning of this year when the first rumblings of reduced budgets and of curtailed staffs became audible, the Association launched an inquiry among the health officers of the country to determine the extent to which the financial stringency was affecting them. We received 200 replies. Over 50 per cent had already suffered a budget cut. These varied in amount but averaged 7.4 per cent. The cities, particularly the larger ones, suffered more than the counties or states. But apart from a few outstanding instances, the reductions were small and were easily absorbed either through a slight reduction in the salary scale of the staff or through a contraction of the less important activities. More ominous was the fact that 56 health officers reported that further cuts were in prospect.

To bring our knowledge up to date and to determine, if possible, how serious the situation is at the moment, I sent out another questionnaire about a month ago to the same group of health officers. We have already received 345 replies from 40 states, 165 counties, and 140 cities. Our material is fairly representative, covering health departments in every part of the country. There has been no reduction of the health budget in 1932 in 24 states, 48 counties, and 45 cities, although in many of these, there had been a cut in the preceding year. In the remaining 228 offices, there were reductions varying all the way from less than 5 per cent as a minimum to a maximum where the department has been entirely eliminated. The average reduction in these 228 departments was about 11 per cent. Again we find that the cities, particularly those with more than 500,000

population, suffered most. Detroit, Pittsburgh, and Baltimore were most severely affected. Toledo, Akron, Norfolk, and Houston, received big cuts. The reductions in a few of the states were particularly large. In North Carolina, a general reduction of 33 1/3 per cent was made. In Florida and in New Jersey, the reductions were about 20 per cent, and in Ohio, 17 per cent. New York State fortunately suffered no loss but rather received an increase in its budget. A number of county health organizations, including Coffee County, Ga., McCurtain County, Okla., Greenwood County, Kans., were discontinued. In Anderson County, S. C., a budget of $91,000 in 1931 was cut to $7,000 in 1932. In Orange County, Calif., and in Marion County, Ore., the budgets were reduced about one-third. A large number of health officers continued to report that further cuts were in contemplation.

TABLE 1

SURVEY OF EXPENDITURES BY PUBLIC HEALTH DEPARTMENTS IN 1932

	Total	*States*	*Counties*	*Cities*
Total number of questionnaires returned	345	40	165	140
Number of health officers supplying budget data	304	33	144	127
Total amount of budgets reported for 1931	$50,647,431	$17,258,682	$2,638,017	$30,750,732
Total amount of budgets reported for 1932	47,011,886	17,290,615	2,357,892	27,363,379
Net increase (+) or decrease (—) in 1932	—3,635,545	+31,933	—280,125	—3,387,353
Per capita Health Office expenditure in 1931		.18	.42	1.13
Per capita Health Office expenditure in 1932		.18	.37	.99
Number of health officers reporting budget reductions in 1932	228	16	117	95
Total amount of budget reduction in Departments reporting reductions in 1932	$4,678,135	$882,634	$341,281	$3,454,220
Percentage of reduction in above Departments	11.1	8.4	16.7	11.6
Number of health officers reporting salary reductions in 1932	135	11	68	56
Number of health officers reporting reduction of one or more activities in 1932	147	18	73	56
Number of health officers anticipating further cuts in 1932	53	11	24	18
Personnel dropped during 1931 and 1932				
Total	1,242	222	153	867
Physicians and dentists	237	20	24	193
Nurses	362	52	66	244
Others	643	150	63	430

Needless to say, such drastic changes required rapid and thoroughgoing adjustments. In 135 departments, salaries were reduced in varying amounts, and in many other instances a loss of

personnel was also made necessary by the reduced resources. Our record is obviously incomplete but it shows that in these 345 departments there was a total loss of well over 1200 persons, including physicians and nurses. Detroit alone lost over 100 employees, and Baltimore dropped 93 from its staff. It is furthermore significant that in the adjustment of activities, certain branches of health work suffered more than others. Child welfare and public health nursing, for example, seemed to have borne the brunt of the reductions. On the other hand, tuberculosis activities were, for the most part, disturbed hardly at all. It would be interesting to know what determined this peculiar policy in so many of the communities. Was it not because those in charge of tuberculosis work were better able to convince their communities of the importance of their efforts?

The present tendency to cut public health expenditures is of grave concern to all interested in the nation's welfare. Throughout the year, your Association has done everything possible to maintain health budgets. Your President has addressed many meetings and has written hundreds of letters on your behalf urging local leaders in both business and welfare work to keep the health facilities of their communities intact. Nevertheless, as we have seen, reductions have occurred and in many places, they have been large enough to do serious damage to the organizations. Nothing can be more certain than that in the past the health departments of the country have not been over-extended. Health officers and health workers generally have been notoriously underpaid. Health departments have been understaffed and their budgets do not, therefore, lend themselves to deflation. We know, for example, that the average expenditure for all health services both public and private in a group of 175 cities, for which reasonably accurate information was available through the Health Conservation Contest last year, was only $1.12 per capita per annum. Even in the 36 cities which won the highest awards, the average expenditure was $1.71. On the other hand, 15 per cent of the cities spent less than $.50 per capita; 17 per cent spent between $.50 and $.75; and 13 per cent between $.75 and $1. Only a little more than one-half spent over $1 per capita, including both official and voluntary public health agencies. These figures are for cities which have shown real interest in public health work and their expenditures are undoubtedly higher than for cities in general.

In the counties, the budgetary situation has been much worse. Only a quarter of the 2,000 counties in the United States have anything like adequate or full-time health service. Even in the counties where there has been some attempt at organization, the average

expenditure was only $.38 in spite of the fact that county health service, by its very nature, calls for larger per capita costs than do cities. Only a very few counties show expenditures of $1 or more. The appropriations of the states necessarily supplement those of the municipalities and counties. Nevertheless, state health appropriations are still very small. In 1930 they averaged only $.13 per capita, ranging from less than $.01 in Nebraska to $.35 per capita in Delaware.

Altogether, we are spending something like 120 million dollars, or about $1 per capita for health work of all kinds whether administered by official or by private agencies. This is the amount which in the heyday of public expenditure was allocated for this important service. On its very face, this amount is only a fraction of what is needed. The modest estimates prepared by our Committee on Administrative Practice call for appropriations of $2.50 per capita if a well rounded program is to be maintained. In the counties, where health work is more difficult to conduct because of the distances to be covered, the expenditure to be adequate should be nearer $3 per capita. In other words, our expenditures in the past have never reached more than from one-half to one-third of what we could spend profitably. There has been no wild development and no tendency to grow too fast. Very few communities have ever spent enough to derive the great benefits that sanitary science and modern medicine have made possible. It is with meager amounts indeed, that genuine achievements in disease control have been accomplished. We are still very far from where we can afford to cut down on public health work.

What we need in the present emergency more than anything else is to spread among the people, and especially among the leaders, a true concept of the importance of public health in the social economy of the nation. This is obviously your duty. You, who represent the strength and leadership of the nation's health workers, must go back to your communities and broadcast the message I have just given you. Sound the alarm and arouse the public to a realization of the situation that is threatening. It is especially desirable that you win the support of your local medical societies, the chambers of commerce, the business men's groups generally, the women's clubs, and particularly the press. Make them all realize that the maintenance of the public health at high levels is vital to the public welfare. Better times are bound to come. The present emergency which has necessitated the paring and cutting of budgets will undoubtedly pass. The most important question for us is whether the leaders of our states and cities will then restore health appropriations because they appreciate

the basic position of the health movement in modern society. It is essential that this concept be clearly understood, and I propose to clarify it in the final section of my address.

HEALTH AS A FACTOR IN SOCIAL ECONOMY

Little do most of us appreciate the influence which the public health movement has had on our times. It has made a different world for us to live in. Sixty years ago, when Pasteur and Koch were making their astounding discoveries, life was still very cheap. The death rate even in our country was about 20 per 1,000 according to our best estimates. Of the children born in any year, 20 per cent were dead before their first birthday. Diphtheria and the other diseases of childhood decimated them during their toddler years. Typhoid fever and malaria laid their heavy toll on adolescents, and tuberculosis was a constant menace to young adults, breaking up families and causing much poverty and misery. The expectation of life under the conditions then prevailing was just over 40 years. It was indeed a fortunate family that did not show the marks of premature bereavement; no wonder people were so keenly aware of health hazards!

How different is the picture today. The expectation of life of the new-born is now 60 and not 40 years. The infant mortality is not 20 per cent, but only a little more than 6. Children need not get diphtheria, nor young people typhoid fever; and if parents and teachers are watchful, young men and women need not suffer from tuberculosis. The heavy hand of disease and the possibility of premature death has been lifted from the families of the country, permitting them to work out their destinies within the limits of their native abilities. These changes have revolutionized our social economy. They have made it possible to build up our cities into enormous aggregations of people. The extensive urbanization of our population would have been impossible but for our increased knowledge of the nature of the communicable diseases and how best to control them. We ordinarily completely overlook our dependence on sanitation and the many other activities of our health services.

The public health movement has added enormously to our wealth and capacity to live well. For a number of years I have attempted to demonstrate that life and health are our greatest assets. In *The Money Value of a Man*, Dr. Lotka and I have compiled figures which show the commuted values of net future earnings of people in various income classes and at various ages of life. Our calculations indicate that the money value of our people transcends all other forms of

capital and the aggregate is, in fact, 5 times as great as the total of all of our material resources. These figures and our mode of approach are coming more and more into general use, not only here but in other parts of the world. Professor Winslow especially has performed a valuable service in applying the tables to various places, including the cities of Syracuse and New York where extensive public health projects have been conducted in recent years. He has shown that the reductions in death rates from a few of the diseases which undoubtedly respond to organized effort have resulted in enormous savings of capital values. In New York City, for example, an annual expenditure of less than 15 million dollars for health promotion of all sorts by public and private agencies has produced an aggregate saving of over 200 million dollars annually. In Syracuse, the mortality reductions for a limited number of age groups and for a few diseases represent a saving of 3 million dollars a year accruing from a total health budget of less than $500,000. Dr. Shepard of San Francisco has in a similar manner calculated the savings which have been or could be accomplished in some of our western states through the strengthening of their public health services. Dr. Pollock has computed the money losses resulting from mental disease. Others, I am confident, will be tempted to utilize the figures which we have made available, to show the wide disparity between the savings resulting from competent public health work and the low cost at which these savings are made possible.

I need not amplify this thesis here except to say that the public must become more generally aware of the great economic value which human beings possess and the enormous losses which communities sustain when workers are thrown out of employment because of illness or when premature death deprives families of their support. This has not been an academic discussion; nor is our computation one of paper values. Our findings have perfectly definite and practical implications. When a death from typhoid fever occurs, it is not only the family that suffers the loss of many thousands of dollars. This loss is soon distributed over the whole community. Reduced taxes come into the public treasury. The community is often forced to maintain the dependents of the deceased, and very often must assume the added cost of providing over long periods for neglected children and disrupted homes. We do not ordinarily recognize the solidarity between the community and the individuals that compose it. I would not stress the money value of life except that such evaluation helps to make us aware of our mutual interdependence and the significance of each individual to the modern state.

If we were then motivated by only the most selfish considerations, we would be very careful to maintain our public health services at the very height of their efficiency even during periods of depression. It is obviously penny wise and pound foolish to do anything else. After all, public health work as it is conducted even in the best departments, costs very little. From $2 to $3 per capita would give most places excellent service, worth many times that amount. No community even at present is so poor that it cannot afford to safeguard the life of its citizens. No city, county, or state can run the grave risk of wrecking the public health organization which has been built up over many years. This is certainly no time to drive trained public health servants out of the profession; nor to drop well tried and useful activities. Unless we are very careful, we may through these attempts at false economy let loose forces which will undermine our very capacity for speedy economic recovery. I hate to think what it would mean in cold dollars and cents if we were suddenly confronted with epidemics of typhoid fever, of smallpox, or of diphtheria. The health protection of our communities is like a dyke which prevents the ravages of a flood. Once our defenses are weakened, increased sickness and death would make economic recovery all the more difficult. If governmental economy is necessary (and everyone is agreed that it is), there are many types of activity less vital that should be curtailed first—not one that threatens life itself.

But I am loath to rest my argument for public health service on economic grounds alone. The knowledge and practice of good public health have enriched every phase of modern life. They have raised the very quality of our civilization. The control of disease has banished the fear of premature death and has thus added to the joy and cheerfulness of life, as is evident when we compare conditions here with those prevailing in the Orient. The reduction of physical disabilities has made life fuller, diverting energies that were formerly utilized in the struggle to live into more constructive channels. When people no longer have to fight against pestilence and plague, they have time to devote to the peaceful arts and to other creative activities. The status of the family is being changed as a result of the health movement. The family group is now kept together until the children have reached maturity. No one can possibly overestimate the significance of this to the well-being of the next generation. The survival of young children has made it possible for us to balance our population without undue childbearing, thus releasing the energy of the mother to other activities of the family and the community. Richer content has been given to social life which has rapidly filtered

down to the benefit of the individual man, the ultimate and only real unit of value.

As in the field of medicine, public health work makes no distinction between the rich and the poor, between the high and the low. The prevention like the cure of disease knows no levels. The method and spirit of this movement maintains the finest of democratic traditions and holds out the largest promise for a glorious future. It is this phase of health service that should give purpose and direction to our professional work.

Do we the health workers of America need a better creed or a greater inspiration to carry on? Ours is the great opportunity. When all the world is sick, when business falters and counsels waver, we at least know what to do. Let us be equal to the occasion! Let us maintain our high purpose to keep the people well against all odds. Our effort will help the nations weather the storm. I hope it may also show those in high places how other public services may best be conducted in a democratic government.

Doctors Differ

"DOCTORS differ" is a rebuke which the profession inherited when the title of doctor was, by common custom, extended to medical practitioners. It is well known that the saying had nothing to do with medicine, but was levied against theologians, not without some deserving. But now when it is used, and that is not infrequently, it is directed against the practitioners of the medical arts. Lord Dawson has, on several occasions, resented the innuendo of this popular saying. He has pointed out, with much truth and justice, that differences of opinion in medicine, the existence of which is beyond denial, are trivial when compared with the differences which are rife among politicians, theologians, sociologists, and, we might add, biologists, and are greater only than those among the practitioners of the physical sciences. The art of medicine is among the oldest things in human culture, but the science of medicine is one of the youngest. Originally founded on magic and superstition, not unmixed with craft, fostered and developed by observation and experience, it was not till the dawn of modern history that the art of medicine began to rest on logical deductions from established evidence—which is science—and it has not yet been able to shift over completely to this more solid foundation. Medicine is still in a transitional stage. Chemistry has discarded alchemy, astronomy has forgotten astrology, but medicine still embraces the mediaeval lore which in past ages took the place of science. Much of the nomenclature still used by us does not belong to science, and the use of words, however much their meaning may be modernized, carries with it traces of the philosophy which gave rise to them.—Abstract from Address by Lord Dawson of Penn in accepting the Presidency of the British Medical Association for the centenary year. *Med. Off.*, July 30, 1932, p. 41.

Relapsing Fever in California

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ENDEMIC focuses of relapsing fever have been reported in Colorado, Texas, and California. In 1921, Dr. Le Roy Briggs of San Francisco reported 2 cases in which the infection was contracted at Polaris on the Truckee River, California. The diagnosis of both was confirmed by the demonstration of spirochetes in the blood and both responded to treatment with neoarsphenamin. These patients had been bitten on the legs by insects. Urticarial marks on their legs and blood spots on the bedding warranted this conclusion, but no bedbugs could be found and no ticks were seen at any time during the trip.

No further evidence of relapsing fever came to the attention of the California State Department of Public Health until September, 1930, when Dr. George Stevens, Epidemiologist, Los Angeles City Department of Health, reported a case in a school teacher who had lived at Big Bear Lake during July and August. About August 1 she suddenly developed a high fever, severe headache, generalized tenderness of the muscles, and slight dizziness. This illness lasted about 5 days and the patient was well until about August 15. The case was diagnosed during her fourth relapse on September 16 and the diagnosis confirmed by finding the spirochetes in the blood smear. The patient could not recall having been bitten by any insects but had noticed a red spot on her neck which she thought might have been a bite. She had not seen any bedbugs or ticks while there.

In October, 1930, Major V. H. Cornell, Letterman General Hospital, U. S. Army, reported, through the courtesy of the Commanding Officer, a case in which the infection had been contracted at Lake Tahoe where the patient had been from July 9 until July 24. His onset was July 27. The diagnosis was established September 8 when spirochetes were demonstrated in the blood smear. He had been bitten by mosquitoes but knew of no other bites.

Early in November, 1930, Dr. J. D. Dunshee, Health Officer of Pasadena, reported a case in a young man who had been at Lake Tahoe during August. On August 25 this patient had noticed the

bite of an insect under the right ear over the jugular vein which became swollen and very painful and remained swollen for 4 days. On September 9 he became ill and his symptoms recurred at intervals over a period of 3 weeks. Spirochetes were found in blood smears taken October 28.

When the first case of the 1931 season was reported in July, 1931, the State Board of Public Health passed a resolution making relapsing fever a reportable disease. Cases other than those brought to our attention had been diagnosed and it was therefore deemed advisable to conduct an investigation to determine the incidence of relapsing fever, the focuses, the ectoparasites involved in the transmission, and the reservoirs of infection.

To date, 30 cases have been recorded. A tabulation of these is presented here.

The history of Case 25 (C.M.W.) is of interest. This patient was a member of the group conducting field studies this year in the following relapsing fever focuses: Big Bear Valley May 16 to June 4; Lake Tahoe June 8 to June 22; and Packer Lake June 23 to June 30. His duties consisted of shooting and trapping rodents, searching brush and animals for ectoparasites, and laboratory work. He returned from Packer Lake June 30, and on the evening of July 1 developed a fever, headache, generalized pains, malaise, and had a severe chill. During the night he had several chills and his fever continued. He entered the hospital July 3 with a temperature of 102° F., pains in his chest, and a severe headache. The leukocyte count was 13,100 with 89 per cent polymorphonuclears. The following day his temperature was normal. Relapsing fever was suspected because he had been working in infected areas and spirochetes were demonstrated in the blood smear taken July 4. July 5 his temperature rose to 104° and he was given 0.3 gm. of neosalvarsan. His temperature gradually became normal, but the pains in his chest persisted for several days and general weakness continued for 2 weeks. A specimen of blood taken July 4 was inoculated into white mice and the spirochetes were recovered from them.

June 25, while at Packer Lake, this patient had picked up a bag containing 5 rodents recently shot and accidentally smeared some rodent blood on his hands, on which were several open lesions, and he washed them in disinfectant as soon as possible. The pooled specimen of blood from these 5 rodents was inoculated into a white mouse and spirochetes resembling *T. recurrentis* were recovered from the mouse. He was not bitten by any insects to his knowledge nor had he during that trip found any ticks recognized as transmitters of

CALIFORNIA STATE DEPARTMENT OF PUBLIC HEALTH

RELAPSING FEVER — CASES REPORTED TO SEPTEMBER 20, 1932

NO.	NAME	AGE	SEX	ONSET	RELAPSES	SOURCE OF INFECTION	LABORATORY FINDINGS	REMARKS
1.	X.	46	M	8-11, 1921	8-24, 8-30	Polaris, Placer County. Insect bite on legs 8-3	Spirochetes in blood smear 8-25 and 8-30. Citrated blood negative in monkeys and mice	Reported by Le Roy H. Briggs, M.D., *J.A.M.A.* 79: 941 (Sept. 16), 1922
2.	X.	Adult	F	8-14, 1921	8-23, 8-28	Polaris, Placer County. Insect bites on legs 8-6	Spirochetes in blood smear on 8-23 and 8-30 and 8-31. Citrated blood negative in monkeys and mice	Insect as described appeared to resemble a bedbug more than ordinary tick. Neosalvarsan given to Mr. X and Mrs. X 8-31
3.	A.E.Y.	62	M	9-8, 1923	9-15, 9-25	Traveling by automobile in Colorado and enroute from Denver to Los Angeles County, Calif. Stayed in auto camps	Spirochetes in blood smear 9-26	No neosalvarsan given
4.	La P.	Adult	F	1927 or 1928	?	Lake Tahoe—Ward Creek. Insect bites	No examinations made	Missed case with satisfactory clinical history but not confirmed by laboratory examination
5.	S.	Adult	F	May, 1928	?	Insect bites at Ward Creek, Lake Tahoe	Spirochetes in blood smear	Detailed history not available at time of investigation in 1931
6.	M.T.	50	F	8-1, 1930	8-15, 9-2, 9-16	Insect bite on neck 7-20, at Big Bear, San Bernardino County	Spirochetes in blood smear 9-18	History of febrile attacks every 10 days until March, 1931
7.	F.M.B.	50	F	7-5, 1930	7-18, 7-28, 8-7, 8-31	Tick bite 6-29; tick found in bed after biting	Spirochetes in blood smear 8-31	Neosalvarsan given
8.	J.M.	33	M	9-9, 1930	10-13, 10-28 (Dates of earlier relapses not available)	Bitten by insect under right ear on 8-25. Bite painful and swollen 4 days	Spirochetes in blood smear 10-28	History indefinite for interval in September—statement given, after 9-12 temperature recurred off and on with febrile attacks at weekly or 10-day intervals
9.	A.McR.	41	M	7-27, 1930	8-3, 8-6, 8-18, 8-28, 9-7	Patient had been at Lake Tahoe near Carnelian Bay. No insect bites noted other than mosquitoes	Spirochetes in blood smear 9-8. Blood inoculated into rats 9-8 but findings negative	No relapse after 9-7 but neosalvarsan was administered 9-30
10.	R.P.	20	M	6-15, 1930	?	Patient had been in mining country near Salt Lake, Utah, and while there 10,000 sheep had passed through	Spirochetes in blood smear	Case history obtained during 1931 investigation—history incomplete
11.	J.B.	5	M	6-6, 1931	One relapse about 6-17	Patient had been at Big Bear, San Bernardino County, from May 19 to June 7. Red spots on arm but no history of insect bites	One spirochete found in blood smear 6-17; many found during first relapse	
12.	J.A.	5	F	7-9, 1931	7-17, 7-23, 8-3	Patient at Big Bear from 6-28 to onset of illness. Bitten by tick a few days after arrival there	Spirochetes in blood smear 8-6. Rat inoculated with .2 c.c. blood on 8-6 was positive	Neosalvarsan given 8-6
13.	J.McC.	42	M	7-10, 1931	7-18	Patient from Lake Tahoe—no history of insect bites	Blood smear positive for spirochetes 7-20	Neosalvarsan given 7-21
14.	H.P.	23	F	7-15, 1931	7-23, 7-31	Bitten by an insect a day or so after arriving at Lake Tahoe 7-10	Spirochetes found in blood smear. Animal inoculations positive	Neosalvarsan given—Governess to M.L. case

15.	M.L.	12	F	7-18, 1931	7-26, 7-31	Bitten several times by insects, apparently ticks, soon after arrival at Lake Tahoe on 7-19	Spirochetes in blood smear 7-29. Animal inoculations positive	Neosalvarsan given on 7-31. Later 2 ornithodorus ticks found in the cottage
16.	R.D.	8	M	7-13, 1931	7-24, 8-8, 8-21, 9-1	Patient went to Lake Tahoe 6-28 and was bitten by an insect before 7-4	Spirochetes in blood smear 9-1. Animal inoculations positive	Neosalvarsan given 9-1
17.	A.W.	24	M	7-24, 1931	8-9, 8-16, 8-21	Patient went to Packer Lake, Sierra County, 7-17 and returned 7-29. No history of insect bite	Spirochetes in blood smear 8-22	Neosalvarsan given 8-23
18.	L.C.	12	M	8-1, 1931	8-11, 8-19	Patient at Lake Tahoe all summer. No history of insect bites but later an ornithodorus tick was found in the cottage	Spirochetes in blood smear 8-19	No relapses after 8-19—so no neosalvarsan given
19.	C.B.	Adult	M	? July–August, 1931	Four attacks at intervals of 7 to 14 days	Patient resides at Lake Tahoe. No history of insect bites	Two sets of blood smears negative	Case diagnosed on clinical history. Patient resided in area from which 5 other cases originated
20.	E.B.G.	Adult	M	Latter part July, 1931	Recurring attacks until 9-1 when he consulted a physician	Patient had taken several trips into Sierras, Lake Tahoe, and Mono and Inyo Counties	State Laboratory reported blood smears positive on 9-5	Patient seen late in September
21.	C.C.	52	M	7-18, 1931	?	Patient and his brother had worked at Twin Bridges, Eldorado County, and slept in a tent. Had been bitten by deer flies only, as far as they knew	Negative	Physician reported cases in 1932—records incomplete but stated typical relapsing fever and responded to arsphenamine treatment
22.	G.C.	56	M	7-1, 1931	?	Same as Case No. 21—brother	Negative	Same as Case No. 21
23.	F.M.	Adult	M	2-1, 1932	Eight relapses at 8-day intervals over period of 9 weeks	Owns fur farm in Big Bear	Blood smears negative	Diagnosis on clinical history
24.	G.E.C.	Adult	M	4-12, 1932	None	Accidental laboratory infection	Blood smears positive 4-19, 1932. Mice inoculated 4-19 positive	Neosalvarsan given on 4-19
25.	C.M.W.	29	M	7-1, 1932	None	At Packer Lake on special relapsing fever investigation and handled bloody squirrel proven infected with relapsing fever	Blood smears positive 7-4. Mice inoculated with blood taken 7-4 were positive	Neosalvarsan given 7-5. No relapses
26.	S.G.	48	F	7-5, 1932	7-17	Patient had been at Lake Tahoe since middle of June. About 10 days before onset was bitten by "brown insect"	Blood taken 7-20. Smear negative but mice inoculated same day proved positive	Neosalvarsan given 7-20
27.	H.S.	38	F	July, 1932	?	Patient's source of infection given as Big Bear	?	Report just received and history incomplete
28.	H.H.	10	M	8-7, 1932	Diagnosed during third relapse 8-23	Patient had been camping at Big Bear and slept on the ground on blankets. No history of insect bites	Blood smear taken 8-23 positive	History still incomplete
29.	L.K.	42	M	8-27, 1932	None	Patient at Lake Tahoe from about 8-18 to 9-7	Blood taken 8-28 and inoculated into mice proved positive	Neosalvarsan given
30.	D.G.	9	M	?	?	Patient resided at Big Bear	Blood taken 9-10, 1932 and inoculated into mice proved positive.	Recent case, history incomplete

relapsing fever. His laboratory accident was followed 7 days after with a proven case of relapsing fever. This seems to present evidence that his infection was contracted by direct transfer of the spirochetes from the rodent.

The staff conducting the field studies included a bacteriologist, an entomologist and two rodent hunters. All operations were confined to those 3 areas in which all of the reported cases contracted their infection. This investigation was made in collaboration with Dr. K. F. Meyer, Director of the Hooper Foundation for Medical Research, University of California Medical School, and with W. B. Herms, Professor of Entomology, University of California.

A total of 894 rodents was either trapped or shot. A field laboratory was maintained as near the shooting and trapping areas as possible and blood smears were immediately made from the heart. During 1931, whenever possible, blood was taken from the heart and inoculated into white mice. In 1932, animal inoculations were made from all rodents. Later the animals were carefully combed for ectoparasites and then autopsied. All enlarged spleens were removed for further examination.

In the first survey, during the fall of 1931, blood smears were made from each rodent and only a few blood specimens were inoculated into mice. All of these inoculations into mice proved negative but one blood smear from a chipmunk shot near Polaris on the Truckee River which showed a spirochete, and a blood smear from a squirrel killed at Packer Lake which had a number of spirochetes resembling *T. recurrentis*.

The program for this investigation in 1932 was changed so as to provide opportunity for pooling specimens of blood from several of the same species of rodents. After making blood smears from each rodent, pooled blood was inoculated into white mice. To date spirochetes have been transferred to laboratory animals from 9 chipmunks and 2 squirrels. These findings indicate that the rodents play a part in the epidemiology of relapsing fever. Whether they serve as reservoirs of infection or whether they receive their infection from the ectoparasite which also transmits the infection to man, remains to be proved.

More detailed reports will be published when the experimental work included in the special investigation has been completed.

Oysters and Anemia*

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NUTRITIONAL anemia is known to be quite prevalent in children. The majority of cases occur between the ages of 3 months and 2½ years; however, instances of anemia in children up to 5 years are not unusual. Mackay[1] reports that of the infants under 12 months of age which are brought to London clinics, 45 per cent of the breast-fed and 51 per cent of the artificially fed were found to be anemic. If diets low in iron are continued after the usual weaning time, the anemia continues to become more acute. The most outstanding feature of this anemia is that it lowers the resistance of the child to infections and disease.

The two types of secondary anemia occurring most commonly in the adult are chronic hemorrhagic and chlorotic anemia. The prevalence of these is not so well known because they frequently escape recognition and treatment. According to Powers and Murphy,[2] liver extract is of no value in the treatment of these types of anemia, but they respond very favorably to treatment with iron.

It has recently been reported by Levine, Remington and Culp[3] that the oyster is unusually potent in curing the nutritional anemia developed in rats by means of a milk diet. This effect was shown by them to be due to the inorganic elements of the oyster and, further, that elements other than iron, copper, and manganese were not concerned in the regeneration of hemoglobin. Iron and copper have long been known to be present in oysters in concentrations equalled by very few foods.

In the above investigation, oysters from only one locality were used and if this finding is to have practical application in establishing the status of the oyster as an important article of food, it is necessary

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to know what variations exist, as to the antianemic metals, among oysters from different producing areas and at different seasons of the year, as well as to what extent nutritional effect can be correlated with chemical analysis. In the study here reported samples of oysters were collected from all important producing areas on the Atlantic and Gulf Coasts of the United States.

The samples, furnished through the courtesy of oystermen in the various localities, were shipped, iced, in the usual 1-gallon containers. The entire contents of each can, on receipt, were transferred to a large porcelain dish; evaporated to dryness on a steam bath and dried in an oven to constant weight at 80° C.; after which they were ground and preserved in glass jars. Determinations of copper and manganese (Table I) were made by the methods employed in the previous work.[3] Iron was determined by the Kennedy method,[4] care being taken to

TABLE I

IRON, COPPER AND MANGANESE CONTENT OF OYSTERS FROM THE ATLANTIC AND GULF COASTS

Results Expressed as Mg. per Kilo (Fresh Basis)

Locality	*Spring Samples* (Collected in April, 1931)			*Winter Samples* (Collected in Nov.–Dec., 1931)		
	Iron	Copper	Manganese	Iron	Copper	Manganese
			North Atlantic			
Rhode Island	32.1	51.3	1.72	34.4	64.0	2.33
Connecticut	20.9	96.2	1.64	39.3	71.3	2.64
	35.1	122.9	3.16	47.1	137.2	2.82
New York	24.9	77.3	2.16	46.1	133.8	2.70
	30.3	67.8	3.00	38.8	74.7	2.82
	26.7	73.0	2.81	42.9	113.7	2.43
New Jersey	31.7	44.9	1.19	31.5	52.1	1.56
	29.1	41.2	1.05	45.3	34.4	2.45
Average	28.9±1.1	71.8±6.6	2.09±0.20	40.7±1.4	85.2±9.1	2.47±0.10
			South Atlantic			
Maryland	70.1	38.0	3.01	51.0	23.3	2.69
Virginia	53.4	9.0	1.59	135.3	17.4	2.87
	50.0	37.9	2.17	60.8	36.9	2.41
	53.4	6.7	1.26	45.1	22.8	2.07
North Carolina	76.5	6.4	2.46	87.1	6.3	2.98
South Carolina	104.5	10.2	4.16	55.8	9.0	2.50
Florida	54.3	4.6	2.79	56.8	3.4	2.46
Average	66.0±5.0	16.1±3.8	2.49±0.25	70.3±8.1	17.0±3.0	2.57±0.08
			Gulf			
Florida	61.3	11.6	3.98	83.1	20.2	3.58
	63.6	9.9	4.09	65.2	23.7	3.07
Alabama	74.8	5.9	4.00			
Mississippi	52.6	16.7	3.08	113.8	19.1	4.40
Louisiana	37.5	22.7	3.07	90.7	48.2	4.16
	74.5	18.6	4.33	65.8	20.8	3.70
	54.1	26.8	2.93	76.6	28.3	3.70
Average	59.8±3.4	16.0±1.9	3.50±0.15	82.5±5.0	26.7±3.0	3.77±0.13

adjust the acidity of the unknown to that of the standard. Although it is now quite generally conceded that manganese plays no part in hemoglobin building, its determination was included on account of the recent work of Orent and McCollum [5] on the significance of manganese in reproduction and lactation. Differences in the mineral content of the oysters from different localities will be noted from the table, those north of Maryland being lower in iron, and higher in copper than those of Maryland and states south, including the Gulf of Mexico. These differences are statistically significant and are undoubtedly due to the amounts of these metals available in the water or food of the oysters.

An examination of the values for iron and copper of the oyster, in comparison with the extended study of 120 different foods by Hodges and Peterson [6] and of 110 different vegetables and fruits by Stiebeling [7] shows that no other commonly used food except liver surpasses the oyster in the amounts of iron and copper which it furnishes to the diet by an average serving. We may therefore conclude that as a source of these two metals of blood building potency, the oyster is comparable only with liver (Table II).

TABLE II

RELATIVE IRON AND COPPER CONTENT OF SERVING PORTIONS OF SOME COMMON FOODS * WHICH ARE EXCELLENT SOURCES OF IRON

	No. of Samples	Portion gm.	Iron mg.	Copper mg.
Pork liver	4	100	25.00	0.65
Beef liver	4	100	8.30	2.15
Oysters†	43	110	6.20	4.50
Calf liver	4	100	5.40	4.41
Lean beef	2	114	4.45	0.11
Lima beans	3	50	4.31	0.43
Common or kidney beans	9	50	3.97	0.34
Lamb chops	(?)	96	3.20	0.40
Beet greens	3	100	3.13	0.09
Chard	3	100	3.00	0.11
Spinach	23	100	2.55	0.12
Peas	12	100	2.07	0.24

* The material for this table was obtained from Hodges and Peterson[6] and Stiebeling.[7]
† Average of 43 samples from different localities analyzed by us.

In order to test the potency of oysters from different localities in blood building, samples from 14 areas in 13 states were fed to anemic rats. The anemia was produced and the animals were handled in a manner similar to that used in a preceding work.[8] Either 6 or 7 rats were fed on each oyster sample, the sexes being equally divided in the group of 6, 4 males being used in each group of 7. No group contained litter mates.

During the curative period, all oysters were fed at the same level, equivalent to 5 gm. of fresh oyster per rat per day. This level of oyster yielded from 0.137 mg. to 0.523 mg. of iron per day. The samples lowest in iron yielded somewhat less than the amount previously found [3] necessary to bring about complete recovery in 8 weeks (0.17–0.30 mg.), while the one highest in iron yielded slightly more than the amount usually considered optimum for the rat (0.50 mg.). After the first day or two the rats ate the oysters eagerly.

In addition to the 14 groups receiving oysters, 3 control groups were also fed. Two of these received milk plus iron, 1 at the highest level furnished by an oyster sample and 1 at the lowest. A third group received milk only. The 2 iron-fed groups are included in order to demonstrate that the building of hemoglobin in the oyster-fed rats is due to the supplementing of iron by another factor.

Table III shows the amounts of iron and copper furnished each rat per day through supplements, as well as the time in weeks necessary to bring about recovery, which we have placed at 14 gm. hemoglobin.[3] The milk furnished 0.032 mg. of Fe and 0.014 mg. Cu daily. In this table, the various oyster samples are arranged in order of descending iron content, and it will be noted that there is a definite

TABLE III

SHOWING AMOUNTS OF IRON AND COPPER FURNISHED IN THE DAILY SUPPLEMENTS, AND THE RATE OF HEMOGLOBIN REGENERATION

Each rat received 5 gm. oysters (fresh basis) daily.

Group No.	Locale	Iron (mg.)	Copper (mg.)	Time* to reach Normal Hemoglobin Concentration
		Oysters		
IX	South Carolina	0.523	0.051	3.2
VIII	North Carolina	0.383	0.032	5.8
XI	Alabama	0.374	0.030	4.8
XIV	California	0.354	0.058	4.4
V	Maryland	0.351	0.190	5.6
X	Florida	0.299	0.044	4.6
XIII	Louisiana	0.277	0.114	6.0
VII	Virginia—B	0.267	0.040	6.2
XII	Mississippi	0.263	0.084	5.4
VI	Virginia—A	0.250	0.190	6.0
I	Rhode Island	0.161	0.257	8+
IV	New Jersey	0.152	0.216	8+
II	Connecticut	0.140	0.548	8+
III	New York	0.137	0.364	8+
		Controls		
XV	$FeCl_3$	0.523		8+
XVI	$FeCl_3$	0.137	(only slight improvement)	
XVII	Milk only		(continued decline)	

* In weeks.

correlation between iron content and time of recovery, while no such relationship as to copper exists. In other words, all oysters contain an abundance of copper, and when fed at the level chosen in this study, it is iron rather than copper which fixes the rate of recovery. Rates of growth and hemoglobin response are represented graphically in Figure I.

It should be remembered in interpreting the results shown in Table III and Figure I that the dosage of 5 gm. of oysters per rat per day was purposely chosen to yield amounts of iron at or near the minimum effective level, since only in this way differences in hematopoietic potency can be quantitatively demonstrated. Therefore, the fact that the rats in 4 of the oyster groups failed to recover in the 8-week experimental period does not indicate that these oysters are not good sources of hemoglobin building material, for had they been fed at a slightly higher level, good regeneration would undoubtedly have resulted. Likewise, had the experiment been continued a few weeks longer the animals would doubtless have fully recovered. In fact, group II at the end of an additional 8 weeks of oyster feeding (same level) had an average hemoglobin content of 16.06 mg. per 100 c.c.

The calorie intake of our rats was not far from 50 per day. Fresh

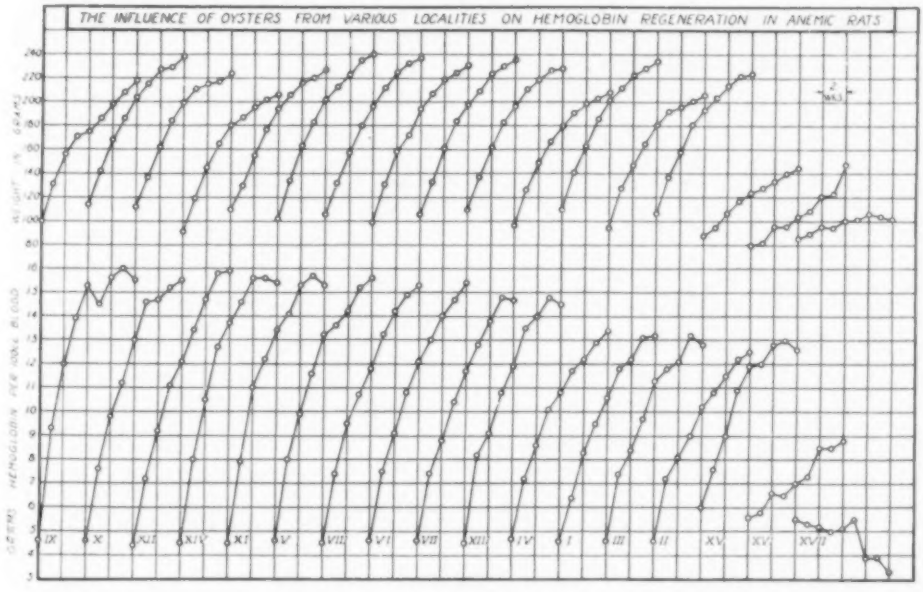

FIGURE I. Showing Growth and Hemoglobin Curves for Rats on Whole Milk Powder and Whole Milk Powder Plus Supplements

Groups I to XIV inclusive are the groups receiving the oyster supplements (Table III). Group XV received a supplement of 0.523 mg. iron daily. Group XVI received 0.137 mg. iron daily and group XVII received powdered milk only.

oysters yield about 0.5 calorie per gm.; hence the rats received about 5 per cent of their calorie intake in the form of oysters, and this was adequate for regeneration of hemoglobin.

SUMMARY AND CONCLUSIONS

The results reported here show that the oyster is equalled or excelled only by liver in the amounts of iron and copper which it may furnish to the diet in an average serving. That these metals are easily available for hemoglobin production has been shown in previous work in which it was found that oysters, oyster ash (acid soluble) and a solution of iron, copper and manganese in the same quantities, fed to anemic rats, brought about hemoglobin regeneration at the same rate in all three cases. Oysters should, therefore, be efficacious in the treatment or prevention of those types of secondary anemia which respond to treatment with iron or iron plus copper. There is increasing support for the view that dietary deficiencies can best be corrected by proper selection of foods, rather than by the use of artificial concentrates or medicinal mixtures. In order to insure an adequate supply of the inorganic constituents for hemoglobin production it would seem a wise plan also to include oysters in the diet of the pernicious anemia patient in conjunction with liver extract, since it is known that liver extract is relatively low in iron.

An average serving of oysters (110 gm.) would furnish about 2 per cent of the human calorie requirement (3,000 calories), and yield about 41 per cent of the daily dietary standard for iron, stated by Sherman [9] to be about 15 mg.

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Child Hygiene*

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THE child passes through five periods of existence, more sharply defined than Shakespeare's seven ages of man. In each of these periods there is need of hygiene if the child is to live, and live his life to the full.

There is the prenatal period, in which, at a headlong pace, the child recapitulates in 9 months the course which his ancestors covered in as many million years and in which 98 per cent of his energy for growth is expended. It is little wonder that, throughout this first portion of his career, the new being holds his breath lest something go wrong with the marvelous multiplication and modification of his living units.

Prenatal hygiene is of great importance even if it has to do only with symptoms and signs that things are going wrong with the maternal host, but there is in addition the very serious problem of anticipating and providing amply, through the host, for every need of the unseen being so that none of the myriad bricks of the human edifice will have to be made without straw.

Besides the problem of adequate building materials for the new being there is already at this early stage the possible threat of damage or destruction by a parasite—and especially by the pale spirochete. The danger is not to be overestimated, ill judged, or considered wholesale; but it exists as a frequent menace of the period. There is also at this period the danger of serious injury from conditions to which the mother may be daily exposed in industry.

The health of the unborn child is bound up with the welfare of the mother in all its phases. It is the business of hygiene to protect the mother during this period, by laws if need be, and to make the mother aware of the needs of the child. It would introduce her to the sources of information and aid, for herself and child, in the person of the private physician, the public clinic, and the printed page.

The second phase of the child's career begins and ends in a

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day. His day of birth is more beset with danger than any future day, even in our machine age, and the short journey the child must make is more fraught with peril than any later excursion of a million times the distance at a million times the speed. It is little wonder that the infant gives a gasp of relief if he escapes the birth canal by nothing worse than a tight squeeze.

Hygiene would reduce the many possible mishaps of this passage of the child from his marine to his terrestrial existence, mishaps which, if they do not destroy him, may mar his mentality or cripple his body through all his future years. Hygiene would discover beforehand menacing mechanical conditions in the mother, or in the child himself, and take advantage of this knowledge for their safety. It would seek to improve the assistance offered by physician, midwife, or nurse during this hazardous performance.

If through good fortune or special hygienic measures the child has avoided invasion by the organism of syphilis, its fellow, the gonococcus, may be lying in wait to ruin his most precious sensory possession. Thousands of living mortals have to thank so simple a hygienic measure as the instillation of a drop of silver nitrate that they are not in an institution for the blind.

The child enters the third period of existence, his infancy, with a cry of distress at finding himself bereft of steady warmth, of ready-to-use food materials, and a relative freedom from the pest of parasites which will prey upon him through all the remaining phases of his existence.

Hygiene hears a helpless demand for more than something that will fill the infant's belly without causing colic. There is a call for everything which is needed to complete the human mechanism already so nearly finished. There is also much need for cleanliness, for warmth, for quiet, for open air, and for opportunity to stretch and kick. Fortunately we are nearly able to understand and to supply the child's needs, but this understanding and supply are not yet for every child. Hygiene has much to do in spreading its present knowledge. Scurvy is now infrequent, but gross or radioscopic signs still mark the majority of children as badly nourished.

That pearl or diamond which makes its appearance in the child's mouth at about the 6th month of this third stage of his existence, and which creates so much excitement and comment among the beholders, is likely to prove a paste diamond or an imitation pearl. The possibility of preventing such biological shoddy (which suggests inferiority in other important structures of the body) is already in sight.

Even with the most auspicious augury for physical and mental development, the infant becomes a hotbed for fission funguses and other parasites to which he is exposed. Hygiene is still a bit helpless here but it has learned much. It affords protection from dysentery and typhoid, smallpox and diphtheria. It saves many a child from tuberculosis and scarlatina, and it often delays invasion by whooping cough and measles until a relatively safer time.

The period of infancy trails off all too soon into the fourth stage, in which the child adds to his accomplishments of air breathing and the metabolism of raw materials, those of locomotion and language, and by so doing adds to the possible dangers of his existence.

The realm of the mental life now unfolds its wonders, but with perplexing problems, including the questions of his own whence and whither. He also enters into the field of social experience with its give and take, its conflicts and compromises, and the anxieties and fears, and fear of fears, which it begets. Along lines of both mental and physical unfolding he needs sympathy and direction, and his immediate guides often need assistance.

As toddler, runabout, preschool child or what-you-may-call-him, exploring the mental and physical world, and mixing more or less with his kind, there is further opportunity for adding to his experiences with parasites, macroscopic, microscopic, and invisible, common and uncommon. Thanks to hygiene the child may enter boldly into many human contacts where death or disability were once nearly certain. By vaccination and isolation hygiene has made this a much safer world for the child in the fourth stage of his existence and by better medical and nursing care it has lessened the damage which may occur to him if he does not escape infection.

Hygiene would not merely think of communicable diseases and their prevention and cure. The child is still developing and it would ask the opinion of the physician as to his present condition and future needs. Periodical examinations are, however, not sufficient. Life is a daily and hourly business and so is health. The child who appears perfect by today's examination may be damaged or dead within a week. Those in direct charge should know the few conditions which the child needs for healthy growth and should be sensitized to the signs and symptoms that things are going well or ill.

Hygiene would guide the child into the few daily practices which bear on his physical and mental welfare. It would encourage him in doing those things which it thinks he ought to do and discourage him in those things which it is evident he ought not to do. Hygiene would lend an attentive ear to the child's researches in the realm of ideas

and would answer his questions concerning the fundamental facts of existence with seriousness and as much wisdom as it can muster.

Finally, the child steps over the threshold of the school and enters on the last and longest lap of his journey. In school he mixes more generally with his kind and finds larger possibilities for experience with microbes which he may have missed elsewhere. Hygiene would reduce these experiences to a minimum by belated vaccinations, and by cultivating the sympathy and wits of teachers and parents so that the danger of infection is reduced to a minimum and the care of the infected raised to a maximum.

Again, hygiene goes hunting periodically into the physical and mental make-up of the child, finding and treating conditions, most of which should have been found and treated or prevented long before, had hygiene been as wise a few years ago as she now is. We can expect the need for medical and dental care of the school child to diminish only with better hygiene for the preschool child, the infant, the child in process of birth, and the unborn. The need will certainly not become less until this is the case.

School hygiene seeks to establish healthful physical and mental practices which likewise should have been formed at an earlier time.

Hygiene hopes for an understanding on the part of teachers and parents of the mental capacities and needs of every child so that his school tasks will be a stimulus rather than a source of depression to body and spirit. Finally along with a thirst for other knowledge, hygiene hopes to arouse, in at least a considerable proportion of pupils, an interest in hygiene which may help them to make the most of their own lives and to make healthier and happier the lives of children which are to be.

In all its ambitions for the child, hygiene is dependent on the help of workers in every other field of public health and medicine. It receives this assistance in ample measure. Even cold and impersonal vital statistics offers at least encouragement, for its figures afford every evidence that hygiene has, in the brief period of its existence, made the life of the child far less precarious and woeful than it was in past ages. The star of hygiene shines with increasing luster on the pathway of every child from his early prenatal to his last school days. Its influence is checked by conditions of the hour which make for poverty and neglect, the chief enemies of child welfare, but hygiene hopes that out of present economic ills will come a better order of society in which the health of all children will be of first concern.

A Ten-Year Study of Toxin-Antitoxin Mixture and the Schick Test in the Control of Institutional Diphtheria

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THE first attempt on the part of the Michigan Department of Health to demonstrate practically the value of toxin-antitoxin mixture and the Schick test was started in October, 1920. It was felt that a study carried out on a relatively stationary, well controlled group of individuals over a period of years would be quite significant. The population of the Michigan Home and Training School at Lapeer was selected as a satisfactory test group.

The diphtheria situation in this institution in 1920 made the conditions for a study of the effectiveness of toxin-antitoxin mixture almost ideal. Diphtheria had been endemic in the institution since its establishment in 1895. In 1920, as in all previous years, the continued presence of diphtheria was a serious economic problem.

Sixteen hundred and fifty-two inmates were first Schick tested with 0.2 c.c. intradermal injections of 1/50 m.l.d. diphtheria toxin diluted in saline. All tests were controlled with 0.2 c.c. injections of heat-killed toxin. Readings were made at 2- and 5-day intervals. Throat swabs were taken on all inmates at the time readings were made and tests made to discover carriers of virulent diphtheria bacilli, who numbered 33, or 1.9 per cent of the population, concentrated in 11 of 17 cottages.

The survey revealed 251 Schick positive reactions, or 15.1 per cent of the population. All positive reactors were given 3 doses of 3 L+ toxin-antitoxin mixture. A retest of the positives in July, 1921 (27 were absent), revealed that the number had been reduced from 224 to 24. They were given a second course of treatment with toxin-antitoxin mixture.

All admissions to the institution after 1920 were either Schick tested and immunized when indicated, or were given 3 doses of toxin-antitoxin mixture with no preliminary test. About 1925, 0.1 L+ toxin-antitoxin mixture was substituted for the 3 L+ mixture formerly employed.

The 1928 population was Schick tested by the institution staff and the positive reactors numbered 344 or 12.3 per cent in a population of 2,784. No testing was done to check the efficiency of the immunizing treatment. The institution remained free of diphtheria from the time of first immunization in 1920 until 1929, when a few cases appeared. This freedom from the disease presented a striking improvement over conditions prior to 1920.

The 1931 population was Schick tested by members of the department, and 441 positive reactors, or 17.5 per cent, were found in a population of 2,513.

TABLE I

SCHICK REACTORS IN POPULATION RESIDENT IN INSTITUTION IN 1920, 1928, 1931

Year	*Population*	*Pos. Reactors*	*Neg. Reactors*	*Per Cent Pos. Reactors*
1920	1,652	251 *	1,401	15.1
1928	2,784	344	2,440	12.3
1931 †	2,513	441	2,072	17.5
1931 **	2,929	679	2,250	30.1

* This number reduced to 24 by additional immunization by July, 1921.
† Excluding 1931 admissions.
** Including 1931 admissions up to July 16, 1931.

The 1931 population included 1,006 who were inmates in 1920. This group was Schick tested in the 1920, 1928, and 1931 surveys, and was continuously resident for 11 years. The results on this group have been singled out for presentation in this paper (Table II).

TABLE II

SCHICK REACTIONS IN 1,006 INMATES RESIDENT IN INSTITUTION FROM 1920 TO 1931

Year	*Total*	*No. Positives*	*No. Negatives*	*Per Cent Positives*
1920	1,006	151	855	15.0
1921 *	1,006	11	995	1.0
1928 †	1,006	104	902	10.3
1931	1,006	154	852	15.3

* Retest after immunization of positives, second course of injections given.
† Another course of injections given, but no retest.

It will be recalled that of the total 1920 population 15.1 per cent were positive (251 in 1,652). Of the 1,006 members of the 1920 population 15.0 per cent were positive, which is probably fairly representative of the entire 1920 population.

The significant fact is that 1,006 members of the 1920 population should be reduced to 1.0 per cent positive in 1921, by artificial immunization, then revert to 10.3 per cent positive in 1928 and 15.3 per cent in 1931, despite treatment of all of the 1928 positives.

The course of reactions when studied in detail over the 11-year period through 3 Schick surveys, clarifies the situation (Table III).

TABLE III

COURSE OF REACTIONS OF 151 INMATES SCHICK POSITIVE IN 1920 AND RESIDENT IN INSTITUTION UNTIL 1931

1920 Schick Survey	*1921 Re-Schick after immunization of all positives*		*1928 Schick Survey All positives given 3 doses 0.1 L TAT*		*1931 Schick Survey*	
Pos.	*Pos.*	*Neg.*	*Pos.*	*Neg.*	*Pos.*	*Neg.*
82		82		82		82
32		32		32	32	
15		15	15 †			15
11		11	11 †		11	
2	2 *			2		2
3	3 *			3	3	
1	1 *		1 †			1
5	5 *		5 †		5	
151	11	140	32	119	51	100
151	151		151		151	

* These positives given another course of injections (3L+) with no subsequent Schick test until 1928.
† These positive given another course of injection (0.1L+) with no subsequent Schick test until 1931.

Eighty-two, or 58.5 per cent, of the above 1920 positives negative in 1921 following immunization were still negative by 1931. Twenty-six, or 18.5 per cent, of the 140 1920 positives immunized and negative in 1921 had again become positive by 1928, and an additional 32, or 22.7 per cent, had become positive by 1931. Of the 140 negatives in 1921 58, or 41.4 per cent, returned to positive. This indicates that toxin-antitoxin mixture as an immunizing agent has been 58.6 per cent efficient over a 10-year span, or 81.5 per cent over 7 years, as measured by the Schick test. The number of 1921 negatives turned positive by 1928 (26) was only 6 less than the number turned positive between 1928 and 1931. The rate of change from artificially immunized negatives to positives was greatly accelerated for the 3-year period 1928–1931 as compared with the period 1921–1928. Beyond the 7-year period a decline in the level of immunity would therefore be expected.

Five inmates required 2 separate courses of treatment to produce the Schick negative state, 3 of whom had again become positive by 1931. Six inmates required 3 courses of treatment, only 1 of whom was negative in the 1931 survey. Altogether, the 1931 survey revealed 51 positives, or 33.7 per cent of the 151 positive in 1920. This latter figure should not be accepted as an indication of immunizing efficiency as it included 5 inmates positive in 1921, 1 positive in 1921 and 1928, and 5 positive in 1921, 1928, and 1931.

Seven hundred and one, or 81.9 per cent of the 1920 negatives, remained negative over the 11-year period; 72, or 8.4 per cent of

TABLE IV

COURSE OF REACTIONS OF 855 INMATES NEGATIVE TO SCHICK TEST IN 1920 AND CONTINUOUSLY RESIDENT IN THE INSTITUTION UNTIL 1931

1920 Schick Survey		*1928 Schick Survey all positives given 3 doses 0.1 L+ TAT*		*1931 Schick Survey*	
Neg.		*Pos.*	*Neg.*	*Pos.*	*Neg.*
701			701		701
82			82	82	
51		51 *			51
21		21 *		21	
855		72	783	103	751
	855		855		855

* These positives given a course of injections (0.1L+).

the 1920 negatives, became positive by 1928; and an additional 82, or 9.5 per cent, by 1931—a total of 154, or 17.9 per cent. Fifty-one of the 72 positives in 1928 were negative in 1931 due to immunization, while 21 were still positive. The total number of positives by 1931 was 103, or 12.0 per cent.

Of the 1,006 inmates, 151, or 15.0 per cent, were positive to the Schick test in 1920. This group was reduced to 11 by 1921 due to immunization. Ten years later, following a Schick survey and a re-immunization of positives in 1928, there were 154 positives, or 15.3 per cent. The total of 154 positives was comprised of 51 (5.0 per cent of 1,006 inmates) of original 1920 positives immunized once, twice, or three times, and 103 (10.3 per cent of 1,006 inmates) of original 1920 negatives who had become positive by 1931.

TABLE V

COURSE OF REACTIONS OF 151 INMATES POSITIVE AND 855 INMATES NEGATIVE TO SCHICK TEST AND CONTINUOUSLY RESIDENT IN THE INSTITUTION UNTIL 1931

1920 Schick Survey		*1921 Re-Schick after immunization*		*1928 Schick Survey*		*1931 Schick Survey*	
Pos.	*Neg.*	*Pos.*	*Neg.*	*Pos.*	*Neg.*	*Pos.*	*Neg.*
82			82		82		82
32			32		32	32	
15			15	15			15
11			11	11		11	
2		2			2		2
3		3			3	3	
1		1		1			1
5		5		5		5	
	701				701		701
	82				82	82	
	51			51			51
	21			21		21	
151	855	11	140	104	902	154	852
	1,006		151		1,006		1,006

DISCUSSION

The first information of significance in the foregoing figures is the unusually low number of Schick positive reactors in the previously unimmunized 1920 population. This percentage was practically identical for the whole 1920 population and for the portion which remained in the institution until 1931. Schick surveys on free living groups of all ages have been uniformly higher in percentage positiveness to the Schick test (Zingher,[1] Ceconi,[2] O'Brien *et al.*,[3] Griswold,[4] Crooks,[5] Cruickshank [6]).

On the other hand, Zingher [1] has reported institutional survey figures of 7.0 per cent Schick positives among males and 10.0 per cent in females. The total figure exceeds the percentage positiveness of the 1920 population reported here by 2.0 per cent.

This low percentage coupled with the continuous presence of diphtheria in the institution prior to 1920 points to a definite causal relationship.

Many Schick survey reports have indicated that, in general, city groups of low economic level existing under crowded conditions, have shown a higher grade of immunity than other city groups living in better circumstances (Park,[7] Zingher,[1] McClelland [8]). Dudley [9, 10] has reported that exposure to diphtheria will result in a high grade of immunity.

In view of the fact that admissions to the Michigan Home and Training School after 1920 averaged from 40 to 60 per cent positive to the Schick test, it would appear that the high grade of immunity found in the 1920 population of this institution was due to continuous exposure to true or sub-clinical diphtheria.

A second point of interest is the fact that 1,006 inmates were 15.0 per cent positive to the 1920 Schick test and 15.3 per cent positive 11 years later, despite the fact that the 15 per cent positives in 1920 were reduced to 1 per cent by 1921 through immunization. The 1931 positive reactors were made up of earlier natural and artificial immunes. The number of 1920 positives shown to be immune in 1921 following treatment who returned to the positive state by 1928, and the increased rate of return between 1928 and 1931, points to a period of artificially conferred immunity approximating 7 years. The fact that diphtheria reappeared in the institution in 1929 strongly supports this assumption.

The literature contains several references to the fluctuations of the Schick negative state. It has been shown by Parrish and Okell [11] that natural and artificial immunes may become positive to the Schick test over periods covering from 1 to 7 years. Park [12] has indicated in a study of artificial immunes, over a 5-year period that, although most cases remained negative, some doubtful positive readings were recovered. Dudley [9, 10] has indicated that exposure to diphtherial antigen may develop an immunity. O'Brien [13] has demonstrated in 6 positive cases that the Schick test may act as a secondary stimulus in the production of the Schick negative state. Our findings coupled with the above would seem to indicate that there are many individuals who tend to be borderline reactors, sometime positive, sometime negative, according to the type of influence. The removal of true or subclinical diphtheria as a factor tending to maintain immunity might, therefore, be instrumental in the gradual change from the natural immune to the positive state. This condition would represent the converse of Dudley's hypothesis.

At any rate, it is apparent that we must not only consider the change of reaction of artificial immunes and length of period of artificially conferred immunity, but also the fluctuations of the Schick negative state in so-called natural immunes.

Whether, under the double influence of artificial immunization and the elimination of true or subclinical diphtheria with its action upon borderline reactors, the percentage positiveness of a closed institutional group of this type tends toward a constant figure at any given time, remains to be determined in future studies. In this study, the constancy of the 15 per cent positive figure in 1920 and in 1931 on the same group was striking.

No commentary on the general efficiency of toxin-antitoxin mixture need be made despite the return of many reactors to the positive state. The general condition of the institution after 1920 as compared with the period before speaks for itself.

SUMMARY

Schick survey results for 1920 have been presented on an institutional group resident over periods ranging from 1895 to 1920, on 1,006 members of the 1920 population resident for 11 years thereafter, and on the population of the institution in 1928 and 1931. It has been shown that the 1920 population was 15.1 per cent positive and that 1,006 patients of this same population resident during the 11 years thereafter were 15.0 per cent positive in 1920, 1.0 per cent positive in 1921 after treatment with toxin-antitoxin mixture and 15.3 per cent positive in 1931. It has also been shown that true or subclinical diphtheria was present as an influence on immunity before 1920 and absent thereafter. Schick results have been presented on 1,006 patients resident at the time of the 1920 survey and during 11 years thereafter indicating that the span of artificially produced immunity runs close to 7 years and that both artificially produced negatives and natural negatives tend to become positive over a given period.

CONCLUSIONS

1. True or subclinical diphtheria may be a factor in maintaining a high degree of institutional immunity to the disease.

2. The span of artificially produced immunity as measured by the Schick test approximates 7 years, immunized positives returning rapidly to the positive state in the following years.

3. Natural or Schick negative reactors tend to return to the positive state with the elimination of the influence of true or subclinical diphtheria.

4. Administration procedure should include Schick surveys on immunized groups coinciding with the decline in the general level of immunity.

5. Schick surveys at intervals beyond the one over which the protection against diphtheria may be assumed should include original natural negative reactors as well as artificially immunized negative reactors.

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The Infection of Cows with *B. abortus* Variety of Brucella from a Public Health Standpoint

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NUMEROUS articles have appeared during the last few years on the occurrence of undulant fever in man. The majority of the cases reported have been in the agricultural or cattle raising centers of the middle West and have been traced to the consumption of milk from cows infected with Brucella organism or to the handling of infected carcasses.

Investigations, stimulated by these reports, have shown that the infection of cattle is not limited to any one section but is endemic throughout the United States. This has led to further agitation by public health officers to have all milk supplies pasteurized.

The following study was begun in 1930, at which time the Research Laboratory commenced the routine diagnosis of cow serums for Brucella infection.

The scope of the work was (1) the examination of the herd, which furnished milk to the tuberculous patients at the Municipal Sanatorium at Otisville, N. Y., for *B. abortus* infection by the agglutination test; (2) the isolation of the organism from the milk of the positive reacting cows and the determination of the variety of Brucella found, and (3) the titration of the patients' serums for agglutinins specific for this type.

The serums of 103 cows were examined. Twenty-seven, or 26.2 per cent, showed complete or strong agglutination in a dilution of 1:50.

The milk of 21 of the positive reactors was examined for agglutinins and the Brucella organism. Seventeen cows were found to have specific agglutinins, and Brucella was isolated from the milk of 13. Data on these cows are given in Table I.

Three cows, C89, C60, and D5, gave histories of having aborted, 1 in 1929 and 2 in 1930. Two, C89 and C60, calved normally subsequently. The third, D5, was with calf when sold in 1931. Cow C31

TABLE I

DATA ON THE POSITIVE REACTORS FROM WHICH *B. abortus* WAS ISOLATED

	Titers of Serum					Titers of Whey*									
Cow	C	1/25	1/50	1/100	1/200	C	1/25	1/50	1/100	1/200	1/400	1/800	1/1,600	Date Exam.	Remarks
B92	–	#	#	#	#	–	#	#	#	#	#	+1	+	4-2-30	Calved normally 1930 1931. Sold 12-26-31.
C61	–	#	#	#	#	–	#	#	#	#	#	+1	*	"	Calved normally 9-30-29. Sold July 1930.
J4	–	#	#	#	#	–	#	#	#	1	1	–	..	"	Calved normally in 1929, 1930 & 1931.
C70	–	#	#	#	+1	–	#	#	+1	+1	–	..	..	4-30-30	Calved normally in 1929, 1930 & 1931.
C71	–	#	#	#	#	–	#	#	+1	+	–	..	..	"	Calved normally 1929 & 1931.
C89	–	#	#	#	#	–	#	#	#	#	#	+	–	"	Aborted 4-8-29. Calved normally 1930 & 1931
C41	? –	#	#	#	#	–	#	+1	+	+	..	..	..	"	Calved normally in 1929 & 1931.
C1	–	#	#	#	#	–	+1	+	+	–	..	..	..	"	Calved normally 1929 & 1931. Sold.
B54	–	+1	+1	+1	+1	–	#	#	+	1	..	..	..	"	Calved normally 1930. Gave birth to sickly calf 1931. Now pregnant.
C31	–	#	#	#	*	–	*	–	–	–	..	..	..	6-27-30	Calved normally 1929. Sterile in 1930. Sold Dec. 1931.
C60	–	#	#	#	#	–	#	+1	+	*	..	..	..	7-23-30	Aborted 1930. Calved normally in 1931.
C93	–	#	#	#	#	–	+	+1	+1	+1	..	..	..	"	Calved normally 1929 & 1930. Apparently sterile in 1931.
D5	–	#	#	#	#	–	..	+1	+1	+1	+	*	..	8-14-30	Aborted 1930. Pregnant when sold in 1931.

* Quarter showing highest titer given.
? Two quarters gave no whey.
= Complete agglutination.
+1 = Strong agglutination.
+ = 50% agglutination.
* = 25% agglutination.
1 = Trace of agglutination.
– = No agglutination.
.. = Not made.
C = Control.

calved in 1929 but remained sterile in 1930, and C93 was sterile in 1931 though her calving had been normal in 1929 and 1930.

Agglutinin absorption tests showed that the strains belonged to the same serological group. A rabbit was immunized with strain B92, and reciprocal agglutination tests were made with its serum and specific serum for strain 426 * which Evans [1] classified as belonging to *B. abortus* variety.

The 11 other strains were found to absorb to the same degree the agglutinins from serum 426 as strain B92.

The ability of these strains to absorb the agglutinins in the melitensis serum for its specific strain 428 and for themselves was then

* This culture was obtained from the National Institute of Health, Washington, D. C.

ascertained. It was found that the cow strains reduced markedly or completely the agglutinins for themselves, whereas the agglutinins for strain 428 were removed only in the higher dilutions.

Theobald Smith and others have stated that it is not possible to differentiate the bovine from the swine strain by agglutinin absorption. Nevertheless the following absorption test was made:

A porcine strain DK obtained from Dr. K. F. Meyer was injected into rabbits to obtain specific serum for this variety. Absorption tests of agglutinins from serum DK and 426 corroborated the statement that *B. abortus* suis and *B. abortus* bovine cannot be differentiated by this method.

TABLE II

THE RECIPROCAL ABSORPTION OF AGGLUTININS BY *B. abortus* 426 AND STRAIN B92

Strain	C	1/40	1/80	1/160	1/320	1/640	1/1280	1/2560
Serum 426 absorbed by 426								
426	–	–	–	–	–	–	–	–
B92	–	–	–	–	–	–	–	–
Serum 426 absorbed by B92								
B92	–	–	–	–	–	–	–	–
426	–	–	–	–	–	–	–	–
Unabsorbed Serum 426								
426	–	#	#	#	#	#	1	–
B92	–	#	#	#	#	#	*	–
Serum B92 absorbed by B92								
B92	–	–	–	–	–	–	–	–
426	–	–	–	–	–	–	–	–
Serum B92 absorbed by 426								
426	–	–	–	–	–	–	–	–
B92	–	–	–	–	–	–	–	–
Unabsorbed Serum B92								
B92	–	#	#	#	#	#	#	+1
426	–	#	#	#	#	#	#	+

= Complete agglutination.
+1 = Strong agglutination.
+ = 50% agglutination.
* = 25% agglutination.
1 = Trace of agglutination.
– = No agglutination.
= Not made.
C = Control.

Huddleson [2] recommends the bacteriostatic effect of certain dyes to differentiate the *B. abortus* suis from *B. abortus* bovine. He has found that basic fuchsin and thionin in specified dilutions will inhibit respectively the porcine and bovine strains. The 13 bovine strains and swine strain DK were therefore plated on liver agar to which basic fuchsin and thionin were added so that the final dilutions of the dyes were 1–25,000 and 1–50,000. Duplicate control plates of liver agar were also inoculated, 1 of which was incubated in ordinary atmosphere and the other with the dye plates under CO_2. The suspension of the organisms which was used for the inoculum was so standardized that discrete colonies were obtained. The thionin in both dilutions inhibited the growth of the cow strains, but permitted the development of strain DK. The basic fuchsin on the other hand inhibited the porcine strain but did not prevent the growth of the cow strains.

Since the isolation of *B. abortus* bovine by Bang [3] in 1927, numerous writers have emphasized the fact that this organism requires an atmosphere containing carbon dioxide for its isolation on artificial mediums. On the other hand, Smith [4] stated: "All reports on the isolation of the swine strains agree that carbon dioxide sealing is unnecessary from the start." In a later article [5] he said that sealing had a distinct retarding effect upon 3 of the swine strains he studied.

Comparative methods of cultivation under CO_2 and in the ordinary atmosphere were, unfortunately, not used for the isolation of the strains. However, the sensitivity of some of the cultures towards CO_2 was definitely indicated. For example the fishings made from the plates inoculated with milk from cows B92 and C61 were grown aerobically and in CO_2. In CO_2 growth appeared earlier and was more abundant. Plates inoculated with milk from cow C89 were incubated with and without CO_2. Growth was obtained only under CO_2. Tissue cultures from guinea pigs injected with milk from 7 cows, C60, C93, C1, B92, C61, J4, and C89, yielded growth under CO_2, while similar plantings in the ordinary atmosphere of the incubator remained sterile. An abundant growth was obtained from the spleen of a guinea pig inoculated with milk of cow D5 under CO_2 whereas the cultures grown aerobically showed only a few scattered colonies.

Additional evidence of the favorable effect of CO_2 upon certain strains is shown by the control plates of the dye test. Though 4 strains, C70, C71, C61, and D5, grew well in the ordinary atmosphere when cultured in high dilution, strain C61 had required CO_2 for its isolation from the guinea pig tissue and the growth of D5 had been markedly increased. Three strains, C31, J4, and B54, had produced

larger and more numerous colonies under CO_2 and 6 strains, C93, C1, C89, B92, and C41, exhibited growth only under CO_2. Thus the growth of 11 strains was favorably influenced by CO_2.

McAlpine and Slanetz recommend the utilization of glucose as a means of differentiating the porcine and bovine strains. They found that the former used from 4 per cent to 18 per cent of the available sugar as against 2 per cent or less by the bovine cultures. Since the sugar is not fermented in appreciable amounts, these strains produced a larger amount of NH_3 than the porcine cultures.

Following the procedure advised by these writers, 2 porcine and 8 bovine strains were examined for their utilization of sugar and production of NH_3.* It was found that 1 of the porcine strains, 438, used the largest percentage of sugar, but, contrary to the results of McAlpine and Slanetz, it produced the largest amount of NH_3. The 8 bovine strains used from 4 per cent to 11 per cent of the available sugar, thus placing them in the porcine group if we accept this method of classification. Meyer and Zobell [7] have subjected 73 strains—33 abortus, 20 melitensis and 19 suis, to this test. They conclude " the quantitative determination failed to demonstrate any appreciable differences in the dextrose utilization."

Through the courtesy of Dr. Louis Cohen, Medical Superintendent at the Municipal Sanatorium, Otisville, N. Y., serum from 223 patients was obtained, representing approximately 65 per cent of the total number in the hospital from March 28 to June 4, 1930, the period in which the examinations were made. Personal objection or condition of the patient prevented the taking of the blood from the remainder.

Four patients were found to be positive reactors and 6 partial reactors. The titrations are shown in Table III.

The history of patient J. S. whose serum agglutinated completely in a dilution of 1–640 is as follows:

> J. S., a case of bilateral moderately advanced tuberculosis, admitted November, 1927. No particular complaint until February 15, 1930, when he suffered severe headache, pains in abdomen and painful articulations. This patient, always apyretic before, had a continuous type of temperature ranging around 101° F. from February 20 to April 9, 1930. This condition left him as suddenly as it appeared. By May 19, 1930, he had apparently recovered but continued to feel weak and was losing weight. The lung condition was about stationary.

This was the only case of those showing agglutinins which manifested symptoms typical of Brucella infection. The stool and blood cultures made May 13 and May 22 respectively yielded no Brucella

* The determinations were made by Miss McGuire of the Harriman Research Laboratory through the courtesy of its Director, Dr. Falk.

TABLE III

THE TITERS OF PATIENTS' SERUMS AT THE MUNICIPAL SANATORIUM WHICH SHOWED BRUCELLA AGGLUTININS

	Titer of Serums							
Name	C	1/25	1/50	1/100	1/200	1/400	1/800	
C.G.	–	‡	‡	+1	+	*	1	
M.K.	–	‡	‡	+1	+	1	..	
E.N.	–	‡	‡	+1	1	–	..	
J.S.	–	‡	‡	‡	‡	..	..	
L.S.	–	+1	+	1	–	..	..	
A.D.	–	*	*	1	1	..	..	
G.U.	–	*	1	–	–	..	..	
J.M.	–	+	1	–	–	..	..	
R.B.	–	+	–	–	–	..	..	
M.D.	–	‡	‡	*	–	..	..	
	C	1/20	1/40	1/80	1/160	1/320	1/640	1/1280
J.S.	–	‡	‡	‡	‡	‡	‡	+

‡ = Complete agglutination.
+1 = Strong agglutination.
+ = 50% agglutination.
* = 25% agglutination.
1 = Trace of agglutination.
– = No agglutination.
.. = Not made.
C = Control.

organisms. The feces were examined according to the procedure of Amoss and Poston.[6] The blood culture was examined weekly for a month. It is possible that a slight infection may have occurred in the other 3 positive reactors which was obscured by the tuberculous condition.

The presence of Brucella agglutinins in the blood serum of man with the absence of clinical signs of infection has been reported by various writers. The following experiment was undertaken to see if rabbits fed with milk containing a live avirulent strain of *B. abortus* as well as a heated suspension of the same organism would produce Brucella agglutinins.

Strain *B. abortus* 426 was used for the feeding. This culture was

grown on liver agar for 48 hours, and after suspension in NaCl was standardized by the Wright method. Half of every suspension was heated to 60°–65° C. for 1 hour, after which sterility tests were made. When the number of organisms had been ascertained, the dead and living suspensions were diluted to the desired number with sterile milk.

Mortality was high from extraneous causes in rabbits receiving both living and dead suspensions. All of the rabbits did not respond by the production of agglutinins. The time of the appearance of these antibodies varied, but as a rule 5 to 6 weeks' feeding was required before the maximum titers were obtained.

Fifteen rabbits were fed dead suspension in the first series. Eight of these died between the 9th and 19th day of feeding, 3 of which showed a slight response. Four rabbits, 101, 120, 425 and 296, though fed for a period of 7 weeks showed no agglutinins. Nedzel and Arnold [7] found that by suspending *B. prodigiosus* in egg white and injecting directly into the duodenum the absorption from the intestinal tract into the blood stream was markedly increased, and concluded that the egg white increased the permeability of the intestinal wall. Rabbits 425 and 296 were given 5 c.c. of egg white before feeding the infected milk for 5 days, but neither responded with agglutinin production. To determine whether these animals were refractory to the artificial stimulation of agglutinins they were given intravenous injections of dead *B. abortus*. The serum of 425 gave complete agglutination in a dilution of 1:1,600, while that of 296 gave a strong reaction in the same titer. Four rabbits, 442, 115, 940, and 315, responded to the feeding by agglutinin production.

Six rabbits were fed the live suspension. Two died the 11th and 16th day without the appearance of agglutinins. Rabbit 118 showed agglutinins on the 18th day of feeding but died 2 days later. Rabbit 258 was fed for 22 days, when feeding was discontinued as no agglutinins had appeared. Rabbit 219 showed a maximum titer on the 34th day when feeding was stopped. The serum of rabbit 609 showed its highest titer on the 30th day. Despite the continued feeding, the titer was not increased.

The serum titers of 3 rabbits in the second series were higher than those in the previous feeding experiment probably due to the larger doses given. Four rabbits were fed dead suspensions, approximately 200 billion daily. The serum of rabbit 501 showed a strong reaction in a dilution of 1:800 on the 17th day of feeding, but died the day following the last bleeding. Rabbits 503, 522, and 523 responded poorly to the feeding and despite the continued inoculations *per os* the titers of their serums decreased.

The serums of 3 rabbits fed the live suspensions exhibited agglutinins in relatively high dilutions. Rabbits 521, 636, and 287 gave strong reactions in dilutions of 1:800, 1:1,600, and 1:6,400 respectively. Under continued feeding the titers of rabbits 521 and 636 were maintained while the agglutinins of rabbit 287 showed a gradual decrease. Tables IV and V give the doses and appearance of agglutinins.

TABLE IV

AGGLUTININS PRODUCED BY FEEDING *B. abortus*—EXPERIMENT 1

	Rabbit	No. of *B. abortus* in Billions	No. of Days Fed	Day on which Maximum Titer Was Reached	Dilution of Serums	Percentage of Agglutination
Killed *B. abortus*	115	*	31	23	1 – 200	100
	315	200	38	33	1 – 200	75
	442	200	14	13	1 100	100
	940	200	37	28	1 – 200	75
Living *B. abortus*	219	†	31	34	1 – 800	75
	609	200	49	30	1 – 800	100

* Rabbit 115 received 20 million April 10–24
50 billion May 1–4
100 billion May 5–8

† Rabbit 219 received 20 million April 10–30
50 billion May 1–4
100 billion May 5–12

Since the ingestion of dead and live Brucella organisms may result in the production of agglutinins in experimental animals, it is not surprising to find these antibodies in the serums of a small percentage of the patients at the Otisville Sanatorium. Every patient was required to drink daily at least 3 pints of milk, which was raw and came from a herd of which 26 per cent was found to be infected with the Brucella organism. The milk of 17, or 80 per cent of the 21 cows whose milk was examined, showed agglutinins in the whey which indicated infection of the udder. That only 1 patient presented evidence of clinical infection emphasizes the low virulence of these strains for man.

TABLE V

AGGLUTININS PRODUCED BY FEEDING *B. abortus*—EXPERIMENT 2

	Rabbit	No. of *B. abortus* in Billions	No. of Days Fed	Day on which Maximum Titer Was Reached	Dilutions of Serums	Percentage of Agglutination
Killed *B. abortus*	501	200	17	17	1 – 800	75
	503	200	52	11	1 – 50	75
	522	200	49	17	1 – 100	75
	523	200	37	12	1 – 50	100
Living *B. abortus*	636	200	58	27	1 – 1,600	75
	521	200	43	34	1 – 800	100
	287	200	58	33	1 – 6,400	75

SUMMARY

The serums of 103 cows were examined for Brucella agglutinins. Twenty-seven, or 26.2 per cent, showed a complete or strong reaction in a dilution of 1:50 or higher.

The milk of 21 reactors was tested for the presence of agglutinins and Brucella organisms. The milk whey of 17 cows showed agglutinins. Of these 7 gave complete or strong reactions in a dilution of 1:200, 5 showed complete or strong reaction in a dilution of 1:50, and 5 showed partial reactions in dilution of 1:25 and 1:50 of the milk whey. The milk of 13 cows yielded Brucella organisms.

The 13 strains were found to belong to the bovine variety of Brucella by the bacteriostatic action of basic fuchsin and thionin.

Eight strains were tested for their ability to use glucose. All were found to utilize this sugar in amounts that would classify them as porcine strains. One swine strain used as control utilized the largest percentage of sugar and coincidently produced the largest amount of NH_3.

The test for the reciprocal absorption of agglutinins from serums specific for porcine and bovine strains showed that this method could not be used to differentiate them.

The serums of 223 patients who drank milk from this herd were examined for Brucella agglutinins. Ten were found to have antibodies in their blood. One, whose serum showed a complete reaction in a dilution of 1:640, gave a history indicative of Brucella infection. Three whose serums showed a strong reaction

in a dilution of 1:100 manifested no clinical signs of infection. The serums of 6 showed partial reactions in dilutions of 1:100 or lower.

It has been shown in experimental animals that it is possible to stimulate the production of agglutinins by daily feedings of large numbers of dead and living *B. abortus*.

Abortion occurred in 3 of the 13 cows from which Brucella was isolated. Two of the 3 calved normally the following year and 1 gave birth to a sickly calf. Ten cows gave no history of abortion though found to be shedders of *B. abortus*. Two of these animals subsequently became sterile.

CONCLUSIONS

The milk of cows infected with the bovine variety of *B. abortus* is a potential source of infection for man.

The danger of infection is relatively small when milk contaminated with the bovine variety is considerably diluted.

Brucella agglutinins may be present in the blood of man due to the consumption of milk containing *B. abortus*. These antibodies may occur in the absence of clinical symptoms.

Cows in whom abortions have occurred may develop immunity so that they calve normally and still continue to excrete *B. abortus* in their milk.

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Esthonia Day Nurseries

A RECENT law requires the owners of factories to establish day nurseries close to the factories. The day nurseries are to be open to children under 8 years of age all the year round during the hours of daily work; besides the children whose mothers are employed the day nurseries will also take care of children deprived of mothers but whose fathers or other persons caring for them are employed. Detailed regulations are prescribed for the conduct of these nurseries; a trained staff must be employed.—*Maternita ed Infanzia*, Rome, June 1932, p. 611.

EDITORIAL SECTION

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ALCOHOL AND INHERITANCE

THE work of Stockard, of Cornell University, in 1913 and 1914, on guinea pigs is well known. Based on a long series of experiments in which guinea pigs were kept alcoholized for different periods, Stockard concluded that the presence of alcohol in the circulation injured the germ plasm and produced permanent deterioration of the race, even though the subjects directly exposed were not injured. He found, however, that by the end of four generations the surviving guinea pigs were of superior quality and lived longer than any others previously known, due to elimination of the weaker and defectives.

This report of the Medical Research Council of England [1] gives details of experiments duplicating those of Stockard which have been carried out with greater care, especially in regard to the genetic qualities of the races used. There were matings between males and females both thoroughly alcoholized for periods of from 1 month to 5 years, and 4 successive generations were treated. Also, there were matings between alcoholized males with normal females, and normal males with alcoholized females. There was only one abnormality among 674 control animals, against 10 among 6,309 of those alcoholized.

The general conclusion was that alcohol has no deleterious effect

on the genetic behavior of guinea pigs. Fertility appeared to be unaffected. Males are no more affected than females. Some evidence indicated that there was a deterioration in weight in the descendants of alcoholized stock. The mortality rate for stillbirths and deaths during the first 3 weeks of life is greater for the offspring of directly alcoholized than of the untreated animals, but the highest mortality among such offspring occurred when the parents had been treated over a period of approximately 2 years. The authors believe that this increased mortality might be accounted for by the age of the parents.

In explaining the difference between their results and those of Stockard, it is suggested that the latter had not adequately controlled the genetic behavior of his stock, and that the results which he attributed to alcohol came about through the introduction of one or more parents with unobserved but inheritable qualities able to bring about the effects seen. It is further suggested that his results may have been influenced by some undetected defect in the diets given his animals; in other words, that the effects were due to alcohol plus a deficiency of vitamins. The experiments now reported do not indicate that alcohol *per se* is capable of producing a transmissible injury to the germ cells.

The experiments were carried out with the utmost care over a period of years, and errors do not appear to have crept in. By the same token, there are few more careful workers than Stockard, and until some explanation is brought forward, it seems impossible to reconcile the directly opposite results obtained by him and by the workers of the Medical Research Council. We must remember also that results similar to those of Stockard have been obtained by Pearl of Johns Hopkins in birds, and by other observers in lower forms of life. The authors of the present report, however, state that their results seem to agree with those of the majority of observers in this field.

The report concludes with a statement that these results should not be used by either prohibitionists or those who advocate the use of alcohol by human beings. The study was a purely scientific one, and the authors decry any application to social affairs. It is unlikely that further experiments along this line will be carried out by them on account of the time and labor required. In this country, with the very strong probability that there will be some modification, if not entire abolition, of our prohibition laws, it will be impossible to keep people from making this application of scientific results. Whether or not they are so applied, scientific people are interested

only in the truth. The report must be considered as a valuable contribution to our knowledge of the subject, though we feel reasonably sure that the conclusions will be attacked in one way or the other.

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NEW OCCASIONS — NEW DUTIES

LOWELL once said, "New occasions teach new duties: time makes ancient good uncouth." There is a lesson in public health in the utterance.

This is a new occasion. The world is in the throes of a depression made deeper by the heights to which the world rose before. Layman and professional man alike have taken inventory of the changes the new occasion has made about them. They are many and unusual.

Time makes ancient good uncouth. We have advanced with time and the standards of sewage disposal of an ancient day are today unfit. We have built up treatment works that are examples of the engineer's ability to adapt the principles of science to the difficult task of sanitation. The chemical, biological and mechanical devices have stood as bulwarks between the contaminating flow of municipal waste water and the streams which must be kept clean.

As a result, water supplies have functioned under reduced bacterial loads, despite the continued concentration of population in cities. Fish life has returned to haunts long devoid of aquatic life. Bathing and shell fish areas have again become safe for man's external and internal person. The esthetic sense of the nation is no longer shocked by the sight of floating fecal matter and gassing sludge banks.

Comes the new occasion. The depression has caused municipalities to cast frantically about in search of those services which can stand deep appropriation cuts without producing loud protests from the tax payers. Sewage treatment has, somehow, filled these specifications ideally. Out-of-the-way location, lack of information on the part of the citizens—and the officials themselves—have tempted municipalities to reduce operating funds for sewage treatment. Too many sewage treatment works have been crippled by reductions in personnel and appropriations to permit us to disregard the tendency of other economy seekers to follow suit.

There is danger in such a procedure, a danger that strikes the whole public health field because of the close relation between sewage treatment and mass hygiene. The production of a satisfactory

effluent becomes difficult, streams again become contaminated and unsightly, and the lack of proper and intelligent attention results in a costly deterioration of the costly installations.

We cannot forget that the ancient good is uncouth today. We cannot allow a hard earned public health victory to slip alway from us. The new occasion, the depression, teaches us new duties. It is for every health worker to understand and make others understand the vital rôle that sewage treatment plays in the nation's health.

It will be greatly appreciated if members and subscribers will promptly notify the office of the Association of any change of address.

ASSOCIATION NEWS

Southern Branch A.P.H.A.

THE strength of any organization depends largely upon the strength of its constituent elements. Recognizing this fact and recognizing the far reaching interest of any association of public health workers in America, the southern states are developing a Southern Branch of the American Public Health Association under authority conferred by action of the Executive Board. The development has a two-fold objective:

First—The strengthening of southern membership in the American Public Health Association as the representative professional association of public health workers in America.

Second—The exchange of experience and information relative to public health problems more or less peculiar to the South and sub-tropical regions.

Obviously there will be special problems of peculiar interest to the South, and just as obviously a much larger body of workers can be assembled for regional meetings than could be assembled at remote national meetings. An additional advantage, however, is that attendance at national meetings will be stimulated because of increased interest in the Association as a whole, membership in the parent association being an absolute requirement for membership in the Southern Branch.

The movement was started under very favorable auspices by Dr. Louis I. Dublin, President, at the Tennessee Conference of Public Health Workers last winter. Since that time Tennessee membership in the parent association has been increased from 68 to 162, and at present state health officers in most of the southern states are engaged in stimulating membership for their states.

The first meeting is to be held in Birmingham, Ala., November 14–16, just preceding and conjointly with the Southern Medical Association which itself has a section on public health. In addition, during the same week the National Malaria Committee is meeting, and hence opportunity is afforded to attend three public health programs in the space of one week. The secretaries of these several organizations are working together for development of a program of universal interest with no overlapping. A most successful meeting seems to be in prospect and it is to be hoped that the Southern Branch will be an unqualified success as has been the Western Branch.

NEW MEMBERS

The following list includes applicants who have been approved for membership in the A.P.H.A. by the Sub-Committee on Eligibility. These new members have requested affiliation with the sections indicated, and action by the Section Council will follow.

Health Officers Section

Squire R. Boggess, M.D., Lawrenceburg, Ky., Health Officer

G. S. Brock, M.D., London, Ky., Director, Laurel County Health Department

D. G. Caldwell, M.D., Concord, N. C., Cabarrus County Health Officer

George Y. Davis, M.D., 4329 Euclid Blvd., Youngstown, O., County Health Commissioner

Malcolm T. Foster, M.D., Mt. Airy, N. C., Surry County Health Officer

Ollie M. Goodloe, M.D., Federal Bldg., Jackson, Ky., Director, Breathitt County Health Department

Minerva Gordon, M.D., 324 Pennington Ave., Trenton, N. J., licensed Health Officer in New Jersey

F. G. Granger, M.D., Dothan, Ala., County Health Officer

Arthur M. Johnson, M.D., Health Bureau, Rochester, N. Y., Health Officer
Norris C. Knight, M.D., Indianola, Miss., Director, Sunflower County Health Department
Dr. Edward L. McIntosh, Camden, Ala., County Health Officer
Theodore Meyer, M.D., 28 High St., New Haven, Conn., Student
Ransley J. Miller, M.D., 909 Kansas Ave., Topeka, Kans., City Health Officer
Charles R. Morton, M.D., Madisonville, Ky., County Health Officer, Hopkins County
Percy L. Querens, M.D., 2703 Napoleon Ave., New Orleans, La., Associate Professor of Preventive Medicine, Tulane Post-Graduate School of Medicine; Assistant Health Officer
E. T. Riley, M.D., Frenchburg, Ky., Health Officer
Louis P. Schubert, 58 S. Main St., Manville, N. J., Health Officer
James P. Sharon, M.D., 516 First State Bank Bldg., Fort Dodge, Ia., City Physician
Hilton J. Shelley, M.D., 35 South St., Middletown, N. Y., Health Officer
Dr. Charles S. Stern, 7525 W. Greenfield Ave., West Allis, Wis., Commissioner of Health
C. C. Threlkel, M.D., Morgantown, Ky., Director, Butler County Health Department
W. H. Wheeler, M.D., West Liberty, Ky., Director, Morgan County Health Department

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Maurice Brodie, M.D., Department of Bacteriology, McGill University, Montreal, Que., Research Worker
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Lou Holladay, Southport, N. C., Public Health Nurse

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Epidemiology Section

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Carl E. Rice, M.D., Rolla, Mo., Trachoma Control, U. S. Public Health Service

LETTER FROM GREAT BRITAIN

THE STATE OF THE PUBLIC HEALTH IN ENGLAND

FROM the returns published in the annual report of Sir George Newman, the Chief Medical Officer of the Ministry of Health, for 1931, it does not appear that the financial crisis and the trade depression have had any very marked effect upon mortality and morbidity rates in England and Wales. The death rate for the year and the infantile mortality rate, it is true, are slightly higher than in the preceding year (12.3 and 66 as against 11.4 and 60), but these variations cannot be regarded as anything out of the way.

Commenting upon the causes of death, Sir George points out that death by injury on roads, etc., today stands among the first seven or eight principal causes of mortality. The death rate of 16 per 100,000 is practically double what it was in 1921.

So far as communicable disease was concerned, 1931 appears to have been not unfavorable. Smallpox (variola minor) which had been providing 10,000 to 14,000 cases a year from 1926, gave only 5,664. There was a welcome fall also in the number of cases of and deaths from the majority of diseases in the group, notably diphtheria, scarlet fever, and tuberculosis. Infectious diseases of the nervous system (poliomyelitis, encephalitis, etc.) were also less prevalent. The number of cases of the former—339 with 63 deaths—was the lowest since 1922.

The fact that the maternal mortality rate continues stubbornly in the neighborhood of 4 per 1,000 live births is noted. Though progress has been made in relation to maternity as well as child welfare work, it is mentioned that economic difficulties have prevented some of the expansion and development that it had been hoped might take place following the work and reports of the Maternal Mortality Committee.

In relation to schemes affecting tuberculosis, venereal disease, and cancer, the reports offer reasons for belief that there has been progress also. Greater use has been made of the facilities provided for diagnosis and treatment in the case of the first two particularly, and reference is made to a number of interesting and practical investigations into the treat-

ment of tuberculosis and the causation of cancer.

THE "SEMBLANCE OF INCREASE" IN HEART DISEASE MORTALITY

IN the section dealing with cancer a careful and convincing analysis is made of the cancer statistics with the object of backing up a warning against too readily accepting the growing figures for the crude mortality rate from cancer as evidence of a marked increase in the fatality of the disease.

Rheumatic diseases, to which growing attention has been given during the last few years, have a section entirely to themselves. Acute rheumatism, it is noted, affords "one of the major opportunities of preventive medicine, the fleeting opportunity to prevent organic heart disease." This opportunity some of the great cities have seized while others hang back. The mortality ascribed to rheumatic fever continued to fall, the rate now being less than half that of 1901.

As regards heart disease, the statement of the Registrar-General made in 1928 is repeated that the "semblance of increase" in heart disease mortality is largely fictitious, being due to the increasing age of the population and the change in the practice of death certification which makes much more frequent record of degenerative changes in the heart muscle than was customary a few years ago. In the younger age groups in which rheumatism is a main factor, mortality from heart disease shows a considerable reduction.

A HEALTH EDUCATION CONFERENCE

THE Society of Medical Officers of Health appears to be one of the few bodies in this country that does not arrange for an annual conference on its own account. To some extent, no doubt, this is due to the fact that other bodies, notably the Royal Sanitary Institute and the British Medical Association, at their annual meetings provide facilities for medical officers to confer or for discussions on subjects in which they are interested. The nearest that the society gets to arranging meetings of the type of the annual conference is in connection with a body known as the Central Council for Health Education, which owes its existence to the society and, containing a large representation from it, lives and moves and has a great part of its being in the house of the society.

The objects of the Council, which to a very large extent it secures, are to bring together the various voluntary organizations engaged in health education and to make contact between the organizations and authorities and others who may require their services. The annual conference is held partly in order to advertise the Council, and partly to give the bodies brought together as a result an opportunity of getting together. Recognition is in general given by the Ministry of Health, and health authorities and organizations in sizeable numbers accept the invitation to attend the meeting.

The conference this year is the fifth of the series and is to be held at the London School of Hygiene and Tropical Medicine on November 17. The Minister of Health (Sir E. Hilton Young) has promised to preside and will deliver an address. At the morning session the subject for discussion is "The Churches and the People's Health," to be opened by two representative clergymen of whom the Very Reverend W. R. Inge ("The Gloomy Dean") will be one. In the afternoon, representatives of voluntary health organizations and others will put up a discussion on "The Positive in Health Education." As the phrases "A positive health policy" and "The need for positive health teaching" have been bandied about a good deal of late in certain health propaganda society circles, the opportunity of

talking on this subject will receive wide and ready acceptance.

THE INSURANCE MEDICAL SERVICE

DISCUSSING the work of the insurance medical service, Sir George Newman puts the cost of medical benefit, exclusive of the cost of administration, at £9,497,616, of which over 7 millions sterling was expended in the remuneration of medical practitioners, and about 2½ millions in the supply of medicines and appliances. The amount of time lost by insured persons on account of sickness amounted to 26½ million weeks (509,615 years) or an equivalent of 12 months' work of about 510,000 persons.

The fact of the steady increase in claims for benefit and the causes thereof are discussed at some length. With a view to insuring exercise of greater care in connection with the issue of certificates by insurance physicians, a staff of regional medical officers has been appointed. Though it has only been at work a comparatively short time this staff has already succeeded in securing great improvements in the standard of certification in a number of areas.

In spite of difficulties such as these, that there has been real benefit to the workers as a result of the operation of national health insurance Sir George Newman has no difficulty in showing. More important still, he finds himself able to prove that as a result of the efforts of the practitioners undertaking insurance work—approximately 70 per cent of the registered medical practitioners in England and Wales—much progress in the direction of prevention has been and is being made.

The total number of insured persons is about 16 millions and for these provision is made under the system for securing the two essentials of all preventive medicine—the early clinical diagnosis of sickness and the ascertainment of its causation.

THE COST OF PUBLIC HEALTH WORK

APART from his examination of the cost of the insurance service, Sir George Newman submits figures showing the cost of public health work generally in England and Wales and discusses as to whether or not the expenditure is justified and whether or not the justification is sufficient to warrant its continuance.

The annual expenditure on all public health works totals £57,370,000 (about 200 million dollars). This covers everything, including housing, water supply, sewage and refuse disposal, etc., but excludes voluntary funds and resources, expenditure on institutions for the insane, etc. In the list of what is secured for the money there are probably several items that the determined economist would mark as unnecessary. If he will study the report, however, and recognize what the information given means and, particularly, if he will compare what is spent on health with what goes in other ways, on education for example, or amusements, or alcohol, or tobacco, he must conclude that the money is well spent. He will understand also just why the Government, acting on the advice of the Minister of Health that it was not economy, it was waste, to fail to maintain the nation's health, has determined that the essential health services shall be continued unimpaired.

Sir George Newman's "State of the Public Health" for 1931 is an attractive and inspiring volume, and though, naturally, it will interest most intimately health workers here, as always, its appeal will be international and to workers in the field of preventive medicine generally.

CHARLES PORTER, M.D.

London

PUBLIC HEALTH ADMINISTRATION

Smallpox Types—The mild form of smallpox commonly designated by its Portuguese name, alastrim, has prevailed over vast regions of the United States for over 30 years. It is estimated that the germ of this disease must have been transmitted from one human being to another more than 800 times and yet it is bred true. Throughout all these "generations" the organism maintains its early characteristics.

Cases of this mild strain of smallpox, like those of most contagious diseases, exhibit many minor variations, but without the development of a permanent new type. These variations are of the fluctuating type. No evidence has been found that the mild strain has ever reverted to the classical type, that is, that the pathogen of the disease has ever undergone a mutation in that direction. While it is true that there have occurred in the United States many outbreaks of severe classical smallpox, the cases have been most numerous near the Mexican border and at seaports. A large number of these outbreaks of the severer strain have been definitely shown to have arisen from outside the borders of the United States. Most American health officers and epidemiologists who have had experience with the two types of smallpox do not believe that as yet there has been any reversion of the mild strain to the old classical strain.—Charles V. Chapin and Joseph Smith, Permanency of the Mild Type of Smallpox, *J. Prev. Med.*, 6:273 (July), 1932.

Poliomyelitis in New York—During the epidemic which occurred in upstate New York in 1931 there were 2,020 cases of poliomyelitis. While the peak of the epidemic for New York City occurred in the first week of August, in the remainder of the state the high point was not reached until the first and third weeks of September. Of all the upstate cases 77 per cent occurred in 16 counties which lie along the Hudson River valley and in that part of Long Island outside of New York City. These counties contain only 36 per cent of the upstate population. The three counties immediately adjacent to New York City, Nassau, Suffolk, and Westchester were responsible for 43 per cent of the entire number in the outbreak.

Of the total cases reported 57 per cent were diagnosed and reported before the occurrence of paralysis. In the 1916 epidemic there were 901 deaths among 4,215 reported cases, a fatality rate of 21.4 per cent. In the year 1931 there were reported 2,051 cases with 164 deaths, a fatality rate of 8 per cent.

The author suggests that any one of several factors or a combination of such factors may have been responsible for the decrease in the fatality rate: (1) The virus may have been less virulent. (2) The earlier diagnosis and better general medical and nursing care and the large use of hospital treatment may have been responsible. (3) The use of serum may have produced the more favorable result.

More than 140,000 c.c. of serum was collected from persons who had previously suffered from poliomyelitis and was made available through consulting physicians to every area in the state. Serum was rather extensively used and consequently no adequate control series is available. The fatality rate for the group whose condition was diagnosed in the preparalytic stage was 3.5 per cent. No conclusions have been reached with regard to the efficacy of the human convalescent serum which was used so

extensively that only 73 patients out of a total of 1,559 did not receive the serum.—F. W. Laidlaw, Poliomyelitis in the State of New York in 1931, *J.A.M.A.*, 99: 1053 (Sept. 24), 1932.

Baltimore—The general death rate in Baltimore in 1931 was 14.16, slightly higher than that for 1930 but with this one exception the lowest death rate since 1921. The infant mortality rate was 74.5. The Health Department suffered a reduction in its appropriation for 1932 of 20 per cent over the 1931 budget allowance. This required the laying off of 93 members of the staff. There were immunized against diphtheria 16,239 children of which number 6,400 were treated in the preschool clinics, 7,839 in the school clinics and 2,000 by private physicians. There were reported 416 cases of diphtheria with 23 deaths, a death rate of 2.8 per 100,000 population.

There is reproduced in this report a copy of an abstract of the bill of mortality for the city of Baltimore for the year 1815. In that year there were 1,349 deaths. Consumption was the most important cause with 218 deaths. This was followed by cholera morbus with 167 deaths; 108 deaths from pleurisy and 98 deaths from fits. It is of interest to note that there were only 3 cancer deaths recorded, 1 death from hives, 9 deaths from teething, and 75 deaths from worms. "Sudden" death accounted for 9 and "mortification" was responsible for 5 deaths.—*Annual Report*, Baltimore Dept. of Health, 1931.

LABORATORY

AN ACCURATE METHOD OF READING THE KAHN REACTION

HENRY C. READ, JR.
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ONE of the most important steps in the technic of the Kahn reaction for syphilis is the correct reading of weak positives. I have overcome this difficulty in our laboratory by means of the following apparatus. A small compound microscope (shown in Figures I and II) manufactured by Bausch and Lomb Optical Company, and known as the "Little Gem," is used. The base of the microscope carrying the mirror is detached. A small electric light with carbon filament is encased in a metal box with daylight filter. The box is made fast to the underneath side of the stage by means of screws. A rack made of copper wire, to hold one Kahn tube, is

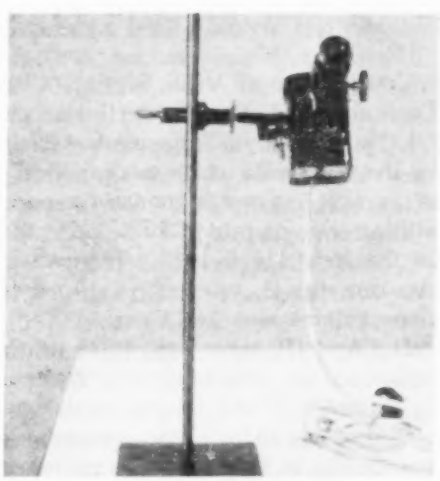

Figure I—Front View

attached to the stage in such a manner as to be between the objective and the source of light. The whole is then mounted on a stand and the microscope tipped nearly to the horizontal. The source of light is just close enough to the tube to allow the small amount of heat radiated to keep the floccules in motion, and produce a boiling appearance. Thus it is very easy to distinguish between floccules and artifacts in the glass tube when focusing the microscope for reading.

The negative reactions show no flocculation. However, there may be an occasional dust particle or other piece of debris present. With a little experience these can be distinguished easily from the true floccules, for the former are rather large in size, approaching black in color and with rather even edges.

The one plus reactions take on the appearance of many minute individual grains of sand. In the two plus reactions the grains of sand seem to have banded together making them appear much larger than in the one plus. The three and four plus reactions can be read with ease without the aid of the microscope, because of the heavy flocculation. Under the microscope the floccules take on a leafy appearance.

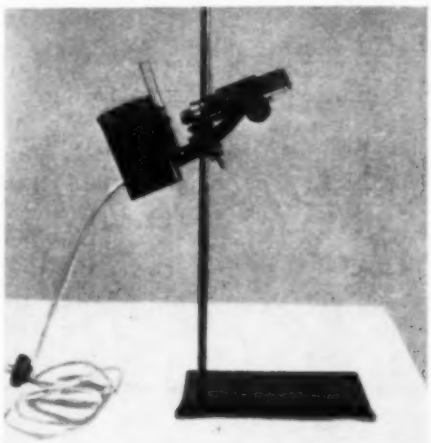

Figure II
Side View. Note proximity of tube to light.

The advantages gained from reading Kahn reactions by this method are: (1) The weak positive results are brought out more clearly, and (2) there is a constant intensity of light, thus reducing a variable factor and making it feasible to read reactions at night.

VITAL STATISTICS

Comparison of Vital Statistics for Tasmania in 1930—The birth rate per 1,000 population in Tasmania was 22.10 for the year 1930, which was practically as low as it has ever been, and compares with an average rate of 24.83 per 1,000 for the decade 1920–1929. The average rate for the 3 years 1919–1921—10 years before—was 26.73 per 1,000.

During 1930 there were 1,948 deaths registered, as compared with 2,176 in 1929, which is the lowest number recorded since 1926. The improvement was chiefly in the rural districts where there were 195 fewer deaths in 1930 than in the previous year. In the urban areas also there was a small net decrease of 33 deaths. The general death rate per 1,000 persons for Tasmania in 1930, 9.00, is the lowest ever recorded for Tasmania. The death rate in 1929 was 10.18. This rate was abnormally high; consequently there is little gratification in using the year 1929 for comparison with the more favorable results in 1930. A more valid comparison is obtained by taking, as a basis of comparison, the results for the previous decade. During the decade 1920–1929 the average number of deaths each year

was 2,074, the death rate being 9.75 per 1,000 persons living, whereas, during 1930 the number of deaths was reduced to 1,948—a rate of 9.00 per 1,000.

The number of deaths under 1 year of age (242) was smaller in 1930 than in any other year, except in 1926 when it was 232. When taken in relation to the number of births subject to the risk of death the rate per 1,000 was 50.6 in 1930, against the best rate of 46.5 per 1,000 in 1926. The average rate for the 10-year period 1920–1929 was 58.6. During 1930 there were 155 stillbirths registered, representing 3.1 per cent of all births, compared with a decennial average (1920–1929) of 3.0 per cent.

The number of marriages registered during 1930 was 1,450 against 1,712 in 1929 and 1,499 in 1928. The marriage rate per 1,000 persons, which had been increasing from 6.79 in 1926 to 6.82 in 1927, 7.07 in 1928, and 8.02 in 1929, declined in 1930 to 6.71, which is the lowest marriage rate recorded since 1918, when the rate was 5.71.—*Statistics of the State of Tasmania*. Commonwealth Bureau of Census and Statistics, 1930–1931, pp. 11–13.

Vital Statistics of Egypt—Egypt, in spite of the invasions it has experienced throughout the ages, shows in certain elements of its population a really remarkable racial purity for the last 6,000 years or so. The Copts of Upper Egypt are, indeed, the direct descendants of the ancient Egyptians as the tombs and paintings of the age of the Pharaohs reveal them to us. Their religion, respected by the Mohammedan conquerors of the country (in the 7th century), has enabled them to keep all their racial characteristics by preventing their fusion with the Arabic elements, which have been specially important in number since the 11th century.

The numbering of the population probably dates back farther in Egypt than in any other country, since the earliest enumeration took place under the most ancient Pharaonic dynasties. Under Amasis II, before the Persian conquest, the population was numbered every year. Unfortunately, the sequence was broken, and in modern times the first computation of the population was made during the French expedition in 1800, when the population was 2,460,200. Other estimates followed in 1821, 1846, and 1873, but it was only in 1882 that a census, as understood nowadays, was carried out. At this time, the population of Egypt numbered 6,831,131.

In addition to the settled population, the Egyptian censuses cover a nomadic Bedouin population whose number is known only approximately (97,381 in 1882, 32,663 in 1917 and 35,500 in 1927).

At the 1927 census, the settled population was distributed as follows: according to nationality—Egyptians 13,952,264, foreigners 225,600; according to religion—Mohammedans 12,929,260, Christians 1,181,910 (including 946,393 Copts), Jews 63,550, other religions 3,144; and according to sex—7,058,073 men and 7,119,791 women. This excess of females is particularly remarkable in a country with a Mohammedan majority (99 men for 100 women).

The registration of births and deaths, practised by health officers and mayors since 1846, became compulsory in 1891. The obligation was then extended to foreigners on August 11, 1912. Births must be recorded within a fortnight. The birth rate is high, varying between 40 and 45 per 1,000 inhabitants (43.7 per 1,000 in 1929). The general mortality is also high, varying between 25 and 29 per 1,000 (27.3 per 1,000 in 1929). The average excess of births over deaths is about 17 per 1,000 (16.4 per 1,000 in 1929).

The increase would be still higher if the infant mortality were not so very high. From 1919 to 1929, it varied between 128 and 159 per 1,000 births.

Nevertheless, these figures are probably inferior to the actual numbers, as certain deaths of female infants occurring in the country escape registration. The infant mortality is markedly higher in the large towns. Among the native population of Cairo, it averaged 289 per 1,000 during the period 1915–1919 and 232 per 1,000 during the period 1925–1929.—League of Nations. *Monthly Epidemiological Report*, the Health Section of the Secretariat, 5–6:10–11 (May-June), 1932.

Vital Statistics for Germany, 1931—According to a report from the federal bureau of health, the live births in Germany for the year 1931 show a decrease of about 96,000 over 1930. This decrease is significant particularly in view of the steady decline in births which has been going on in recent years. To each 1,000 women of child-bearing age there were, in 1913, 116.5 living births; in 1930, 67.2; and in 1931, 61.8. According to statistics for the first quarter of 1932, the decline in the birth rate is continuing. In contrast with the previous years, the decline in births for 1931 was most marked in the communities with less than 15,000 inhabitants.

The number of deaths in 1931 showed an increase of 15,000, notwithstanding the fact that the reduction in births led one to anticipate a decrease of about 8,650 deaths. The infant mortality for 1931 was 0.1 below that of 1930. There are as yet no federal statistics on the chief causes of death in the year 1931. The Prussian statistics, however, which extend through the third quarter of 1931, give information on the more important causes of death, and especially on the increase of mortality in the first quarter of 1931. This increase was caused chiefly by the prevalence of influenza and disorders of the respiratory and circulatory organs.

Aside from the increase in the number of cancer cases due to the greater average age of the population, the mortality figures for 1931 were not unfavorable. There was a marked decline in the mortality from acute infectious diseases, including puerperal fever, diseases of the digestive tract, accidents and, to a slight extent, from tuberculosis. The suicide rate showed a slight increase.—*J. A. M. A.*, 99:402–403 (July 30), 1932.

Unprecedented Rise in the Cancer Death Rate—While health conditions in general have been extremely favorable during the last 2 years, the death rate from cancer has been rising sharply. This is one of the very few unfavorable developments in the public health in recent years.

It is true that, for a long period of years, the cancer death rate, both among the many millions of policy holders of the Metropolitan Life Insurance Company and the general population of the country, has been increasing. But the rise has been slow in each group. During the 12-year period 1919 to 1930 the difference between the minimum crude death rate for the insured (67.0 per 100,000—registered in 1919) and the maximum (79.5—registered in 1930), was 18.7 per cent. In strong contrast with this relatively slow average rise of almost 1.5 per cent per annum in the death rate, there is shown at the end of 1931, a 7.4 per cent rise in a single year; and reports for the first half of 1932 show a further rise of 9.5 per cent over the rate for the like part of last year. If deaths from cancer continue to occur at the present rate throughout 1932, the cancer death rate among Metropolitan Industrial policy holders will have increased more than three-fourths as much, in 2 years, as it did in the preceding 12 years back to 1919.

It cannot be determined at present whether the cancer mortality rate rose as sharply in 1931, among the population at large, as it did among insured

wage earners and their dependents. Unfortunately, only fragmentary and inconclusive mortality data for 1931 are, as yet, available from official sources. Nevertheless, the few reports that have been received strongly suggest that cancer deaths increased last year in the country at large, to an extent that has not been heretofore observed in any single year—although the rise was not as marked as among the working classes. According to provisional mortality reports from the States of New York and New Jersey, the cancer mortality rate in 1931 increased 5.8 per cent and 6.4 per cent respectively in these two states, which comprise approximately one-seventh of the population of the country. Scattered reports from cities show per cent increases of 11.7, 9.1, 5.8, 4.3 and 2.9 in San Diego, Syracuse, Philadelphia, Birmingham and Rochester, respectively. On the other hand only average rises are shown in the States of Indiana and Wisconsin and the cities of New York and New Haven; and small declines were registered in Rhode Island and in Buffalo, Detroit and Milwaukee.

The weight of the evidence is that the cancer death toll is now increasing at a very rapid rate. It has been suggested that the unusual increase, among Metropolitan Industrial policy holders, may have been due, in part, to a change during 1931 and 1932 in the relative age distribution of lives exposed to risk, whereby a considerably larger proportion of the policy holders is now in those age ranges where cancer mortality is the highest. This thesis is not tenable, however. The facts of age distribution among the policy holders show no marked shift. Again, when the 1930 and 1931 cancer death rates are standardized for age, a large increase in the rate is found. Furthermore, no such marked increase in the death rate has been observed in the mortality from cardiac disease, chronic nephritis and cerebral hemorrhage, all of which, like cancer, are diseases of the older ages. The heart disease death rate among the insured rose only 2.1 per cent in 1931 (as compared with 7.4 per cent for cancer), while that for cerebral hemorrhage was unchanged and that for chronic nephritis dropped 1.6 per cent.

In conclusion, some forces must have been at work since the beginning of 1931 to cause a marked acceleration in the number of deaths reported from cancer. It is by no means assured, as yet, that the actual increase in 1931 and 1932 has been as sharp as the figures indicate. There is always the possibility that part of the rise resulted from more accurate diagnoses. An eminent authority on cancer believes this to be true. Many more cases are undoubtedly being discovered through laboratory findings, operative procedures and autopsies, which are being made more often now than ever before.—*Stat. Bull.*, Metropolitan Life Insurance Co., 13:4–6 (July), 1932.

Population Analysis by Place of Birth for the Dominion of Canada, 1931—The census of 1931 gave a population of 10,376,786 for Canada as against 8,787,949 in 1921. This represented a 10-year increase of 1,588,837 or 18.08 per cent for the last census over the previous one. The census of 1921 gave an increase of 1,581,840, or 21.95 per cent, over the 1911 census. Of the total increase in population, shown by the last census, 1,236,511, or 77.8 per cent, was contributed by the native born, 119,298 or 7.6 per cent by persons born elsewhere in the Empire, and 232,416, or 14.6 per cent, born in foreign countries.

The per cent distribution of the population according to birth place, at each census during the past 40 years was as follows: in 1881 in a total population of 4,324,810 the native born comprised 86.06 per cent, the British born 11.07 per cent, and the alien born 2.87 per

cent. In 1891 in a population of 4,833,239 the native born comprised 86.68 per cent, the British born 10.15 per cent, and the alien born 3.17 per cent. In 1901 in a population of 5,371,315 the native born made up 86.98 per cent of the total, the British born 7.84 per cent, and the alien born 5.18 per cent. In 1911 in a population of 7,206,643 the native born comprised 77.98 per cent, the British born 11.58 per cent, and the alien born 10.44 per cent. In 1921 in a total population of 8,788,483, the native born comprised 77.75 per cent, the British born 12.12 per cent, and the alien born 10.13 per cent; while in 1931 in a total population of 10,376,786, the native born population comprised 77.76 per cent of the total, the British born 11.41 per cent, and the alien born 10.83 per cent.

In 1931, the native born constituted 77.76 per cent of the total population of Canada as against 77.75 per cent in 1921; 77.98 per cent in 1911. In 1901 before the provinces of Saskatchewan and Alberta were organized the native born comprised 86.98 per cent of the total population of Canada. According to the last census persons born within the Empire made up 89.18 per cent of the population as against 89.87 per cent in 1921, and 89.56 per cent in 1911. The slight decrease in the proportion of the Canadian and British born shown by the last census as compared with previous ones is attributable largely to the increase shown by the European section of the "foreign born" which advanced from a proportion of 5.23 per cent in 1921 to 6.88 per cent in 1931. The most significant decrease in the foreign born was registered for the United States born, which fell from a total of 374,022 in 1921 to 344,574 in 1931. At the last census they comprised only 3.32 per cent of the total population as compared with 4.25 per cent in 1921, and 4.21 per cent in 1911. The classifications of the foreign born population according to birth places, so far as they relate to European stocks, are based on post-war political boundaries in the last census, as well as in the previous one.—Dominion Bureau of Statistics, *Birthplaces by Sex for Canada and Provinces*, 1931, pp. 1–3. *Census Bull.* 15.

PUBLIC HEALTH ENGINEERING

CITY OF BRADFORD WORKS OF SEWAGE DISPOSAL

1790-1930

THIS is a pamphlet issued in 1931 (3rd ed., 92 pp.). by the Sewage Department of the City of Bradford, by its Chief Engineer, H. Wontner-Smith, describing the history, construction and operation of the Sewage Disposal Works of the City of Bradford, England. Bradford for years has been the center of the wool combing industry in England, and thereby has been confronted with the problem of handling a large amount of waste.

After various trials of precipitants, in January, 1901, sulphuric acid was used and it was found that the sludge could be filter-pressed and the grease extracted. Both grease and dried sludge cake are marketable.

The main works at Esholt serve a drainage area of 20,156 acres and a population of 273,000 people. There is also a smaller works at North Bierley, serving 3,532 acres and 23,500 people. The flow at Esholt is 63 Imperial gallons

per head per day. The average flow is 23.75 million Imperial gallons per day. There is a wide fluctuation in the hourly flow because of industry. Sewage entering the works is one-half domestic and one-half wastes, the latter consisting of wool scouring effluents and dye liquors. The former are very strong in grease and suspended matter. The yearly average analysis of the sewage handled shows in parts per million: Grease 890, Suspended matter 1,450, Oxygen absorbed 246, and Alkalinity 815.

The sewage comes to the works through a tunnel and is put through a grit catching device, is then acidified with sulphuric acid and passed through a mixing tank to two series of precipitation tanks, one containing 20 units for the acid cracking process, and the other 20 units for secondary precipitation. The tank effluent is passed through 53 acres of bacterial filters built up with coal. The sludges are screened, then pumped to the sludge disposal building, where it is treated for the extraction of grease and water. The methods of working are discussed at considerable length.

At the present time some 12,000 to 13,000 tons of acid are used per year. The sludge is held about 3 months in the tanks, arriving in the filter presses with approximately 80 per cent moisture. The acid is made by the City of Bradford, partly at the plant and partly at its gas works. The bacterial filters are made of coal, from ¾" to 1¼" in size. At the time of the general strike in 1926, some 200,000 tons were sold and afterwards replaced. Rectangular traveling distributors are used, drawn by wire ropes.

The sludge treatment is of particular interest. The sludge is heated in 7-ton vats by steam coils to 170° F. It is then forced by ejectors to 128 presses in the press house and is filter-pressed through cotton cloths by alternately feeding heated sludge and super-heated steam to keep up the temperature. Liquid and grease are discharged in the process. About 40,000 cotton filter press cloths are used annually. A cloth lasts from 6 to 8 weeks. Ordinarily, the pressing takes 64 hours, the grease content being reduced in the dry solids from 40 per cent in the original sludge to 16 per cent; the water content being lowered to 26 per cent. The pressed cake is removed to an open air drying area, where it is kept in heaps for 12 months. This reduces the grease content by the "heating" of the material. The sludge is sold. Although various experiments have been carried on with activated sludge and sludge digestion, the present process is the one favored.

Construction of the works is described in detail and interesting data are given on the business side of the undertaking. The works have cost about £1,910,000.

During the war the sale of grease was remunerative, bringing in an income in 1918 of £126,658 sterling. In the first 12 years of the post-war period the sales produced over a half-million pounds sterling. In the years 1920 to 1930 the sale of the sludge brought in an additional total of £40,000. The sludge is also ground to powder, mixed with coal and used for stoking the boilers. The report states that the cost of sludge disposal and pressing (at present around £35,000 per annum) is more than covered by the sales in recovery of grease and manure, but that this revenue does not cover the cost of the whole treatment.

The pamphlet closes with an interesting description of the old Esholt estate, which dates back to 1086. The present offices of the department are in a very interesting and well preserved building, which is of historical interest. The entire estate, comprising 1,700 acres, was purchased, including the village and other lands beside those utilized directly for the sewage treatment.

LANGDON PEARSE

FOOD AND NUTRITION

Antirachitic Value of Milk from Cows Fed Irradiated Yeast—Several workers have reported positive antirachitic properties in the milk from cows fed irradiated yeast if there is incorporated 30,000 to 60,000 vitamin D rat units per day in the yeast. Arrangements were made by the authors to secure "yeast milk" from a herd of 9 cows fed, in addition to the ration, 60,000 rat units as irradiated yeast daily.

This milk was fed to 4 human subjects—2 male infants, aged 16 and 8 months respectively, and 2 female children, 4 years, 11 months, and 3 years, 2 months, respectively, all of whom had definite active rickets as evidenced by roentgenograms. The milk was pasteurized for 3 of the patients and for the 4th it was in addition boiled for 5 minutes. Clinical records of these 4 showed definite progress toward healing of the rickets.

Analyses of the serum-calcium and serum-phosphorus show an increase in the former and a marked increase in the latter after the addition of the special milk. Deposition of bone as shown by roentgenograms was established after 2 weeks on the special milk diet. It has been stated by Howland and Kramer (*Tr. Am. Pediat. Soc.* 34: 204, 1922) that the determining factor in calcification of bones is a figure between 30 and 40, representing the product of the concentration of calcium and phosphorus in milligrams per 100 c.c. of serum. At the beginning of the feeding period the concentration in all cases was definitely under 30, and at the end of the period it varied from 58.8 to 69.4. The authors conclude that there is calcium deposit in the concentration of 30 but that the concentration which permits complete calcification depends upon the rate of growth of the individual.

The opinion is advanced that the administration of antirachitic vitamin in the form of yeast milk is preferable to adding it to food as a therapeutic agent. After 5 minutes' boiling the milk still possessed antirachitic properties.—Edwin T. Wyman and Allan M. Butler, *Am. J. Dis. Child.*, 43:1509 (June), 1932.

Seasonal Variation in Antirachitic Action of Arkansas Sunshine—Biologic determinations of the antirachitic action of sunshine have been made a Little Rock at all times of the year with large groups of animals under carefully controlled conditions. The average daily amount of sunshine necessary to afford the same partial protection against rickets in rats receiving a rachitic diet varied from 5 minutes in May, June, and July to 168 minutes in December, with intermediate values for the other months.—Paul L. Day, *Am. J. Dis. Child.*, 43:1455 (June), 1932.

The Effect of a High Intake of Manganese on the Growth of Rats—This investigation was made on rats before weaning and after weaning. The basal ration used throughout the experiment was that described by Waddell & Steenbock (*J. Biol. Chem.*, 80:431, 1926), and contained 13.4 mg. of manganese per kilo. Female rats which received 10 mg. of manganese per day above that in the stock ration (13.4 mg. per kilo) were as successful in rearing their young as females receiving the stock ration only.

The addition of $MnSO_4 . 4H_2O$ equiv-

alent to 2,000 p.p.m. of ration did not retard the growth of rats over a period of 12 weeks immediately following weaning. Therefore, the slower growth of rats on a modified ration containing added manganese, reported in a previous publication (*J. Biol. Chem.* 90: 65, 1931), was not due to toxicity of this element but to a less suitable source of milk solids.—J. T. Skinner, *J. Nutrition*, 5:451 (Sept.), 1932.

The Effect of Figs and Small Amounts of Raisins on Urinary Acidity—In a previous experiment (*J. Nutrition*, 5:103, 1932), the effect of fresh Malaga grapes, several kinds of grape juices, grape concentrates and 2 varieties of raisins on the urinary acidity was shown. This experiment was undertaken on male subjects to ascertain the effect of raisins and figs. Thompson Seedless raisins and Calimyrna white figs were used. The experiment were of 11 to 12 days' duration.

Each experiment was divided into two periods. For the first 5 days each person received only the basal ration; during the next 6 or 7 days each person received, in addition to the basal ration, a constant quantity of raisins or figs. When the raisins or figs were added to the basal diet, the following results were observed:

A ration of 105 gm. of raisins in bread produced 50 per cent to 60 per cent as great an increase in the pH of the urine as did 300 gm. of raisins. The increase produced by the 105 gm. ranged from 0.45 to 0.60 pH units. Three hundred gm. of figs produced an increase in the pH of the urine ranging from 0.9 to 1.1 pH units. This change was slightly greater than that produced by an equal weight of raisins.

A decrease in the ammonia excreted with a corresponding decrease in the total acidity was noted. The 300 gm. of figs produced a greater decrease than 105 gm. of raisins and also a slightly greater decrease than an equal weight (300 gm.) of raisins.

There was an increase of the alkaline reserve above the normal for each subject, the greater increase being produced by the figs.

A correlation between the alkalinity of the ash and the physiological reaction was apparent. A more basic body reaction was associated with higher alkalinity of the ash.

The organic acids from 105 gm. of raisins daily were completely oxidized by the body, whereas those from 300 gm. were only 99.8 per cent oxidized. However, the organic acids from 300 gm. of figs were oxidized to the extent of 97.5 per cent.—Lawrence G. Saywell, *J. Nutrition*, 5:519 (Sept.), 1932.

The Administration of Ferrous Iodide and Linoleic Acid to Rats Deprived of Vitamin A—Male rats, weighing 38 to 50 gm. at 21 days of age, were given *ad libitum* a diet consisting of extracted casein 70 per cent, starch 20 per cent, yeast 5 per cent, salt mixture 4 per cent, and sodium chloride 1 per cent. This diet was supplemented daily with 0.001 mg. of irradiated ergosterol dissolved in oil. When the rats ceased to grow and developed severe xerophthalmia, which occurred in about 40 days, they were divided into 5 groups which received, respectively, daily supplements of 0.1 c.c. distilled water; 1 drop cod liver oil plus 0.1 c.c. distilled water; 0.1 c.c. ferrous iodide solution; 0.1 c.c. of linoleic acid; and 0.1 c.c. of ferrous iodide solution plus 0.1 c.c. of linoleic acid. All rats were examined at death for infections of the middle ears, of the glands at the base of the tongue, and of the salivary glands, as well as for renal and bladder calculi.

The administration of ferrous iodode and linoleic acid, alone or in combination, was ineffective, either for promotion of growth, the cure of xeroph-

thalmia, or as a preventive of infection or renal disturbance in rats deprived of vitamin A. At autopsy one or more of the typical lesions, associated with vitamin A deficiency, was found in all the rats that did not receive cod liver oil.—Lucille L. Reed, L. B. Mendel, and Hubert B. Vickery, *Science*, 76:300 (Sept. 30), 1932.

The Viability of Lactobacillus Acidophilus as Affected by Freezing in a Sherbet Mixture—To increase the palatability of *L. acidophilus* milk, it was sweetened, flavored, and frozen into a sherbet. Twenty-eight sherbets were prepared and a study made of the numbers of viable organisms remaining after 1, 2, 3, 5, and 7 days of storage at temperatures below —17 C. Four strains of *L. acidophilus* were used in the preparation of the sherbets.

A variation was found in the viability of these strains when exposed to the conditions prevailing in such a frozen product. The numbers of viable organisms in sherbets carrying strain A organisms were reduced to only a few million per c.c. after 5 days' storage, while under similar conditions several hundred millions of viable organisms were usually present in the sherbets carrying the other strains of *L. acidophilus*. A variation in viability was found to occur in cultures of the same strain. Whether or not this variation was due to the age of the cells or some combination of factors was not determined.

A number of these sherbets were prepared so that they differed in reaction only. A more rapid reduction of organisms was found to occur in the sherbets of the higher titratable acidity. The sugar concentration, as it was varied in the sherbet mixtures, causes no significant variation in the viability of the organisms. It was possible to prepare sherbets in which large numbers of organisms remained viable after 5 to 7 days of storage at temperatures below —17 C. when the more resistant strains of *L. acidophilus* with a high initial count were used and the titratable acidity was not permitted to become excessive, preferably not in excess of 1.10 per cent.—Chas. C. Prouty and H. A. Bendizen, *J. Dairy Sci.*, 15:413, (Sept.), 1932.

The Toxicity of Ethylene Oxide—A concentration of 1:400 ethylene oxide was put in a small chamber and breathed by 4 men. It had a pleasant acetic acid-like smell, was slightly irritant to the nasal passages, but produced no after-effects. A concentration of 1:80 had a definite irritating effect on the nasal passages in 10 sec. There was no lachrymation. The liquid placed on skin boils, at once evaporates, leaving no mark, irritation, or erythema. One drop placed in the eyes of rabbits showed sharp conjunctivitis with blepharitis, but the condition subsided rapidly to normalcy in 4 days, and there was no permanent damage to the eyes. Intravenous injection in rabbits, 175 mg. per kg. body weight, proved fatal in 6 hours.

Early symptom was diarrhea and after 4 hours fine tremors of the limbs, the stance was wide and the feet splayed with the head dropping on the floor. Respiration was regular but somewhat hurried. Nystagmus was present and there was incoördination of limbs and jaws, followed by convulsions. Between convulsions the animal lay helpless and unable to hold up head or support body on legs; all the muscles were lax and toneless. A dose of 146 mg. per kg. body weight produced no symptoms beyond diarrhea and dislike of movement. A dose of 133 mg. per kg. was given and repeated after 20 hours.

Following the first dose, the animal showed wide stance, with fine muscular

tremors. The second dose caused death during the night. A dose of 85 mg. per kg. was given and repeated after 48 hours and again in a further 48 hours. After the first dose, there was nothing abnormal; after the second, convulsions followed by recovery; after the third, convulsions and death. Autopsy findings in these animals were congestion of all organs with catarrhal changes in kidney tubules and small numerous submucous hemorrhages in stomach.

A concentration of 1:80 for 30 minutes proved fatal to mice, rats and guinea pigs. Post-mortem changes were marked damages throughout the body. Concentrations varying from 1:80 to 1:150 for single exposures and from 1:80 to 1:800 in repeated exposures were used. In the concentration 1:80 for 30 minutes, all mice (3) were dead in 2¼ hours, the rats (3) were all dead in 6 hours, having become markedly dyspnoeic, two were destroyed after 7 hours and the third survived; all rabbits had slight weakness of hind legs and were killed three days after exposure. Autopsy findings were the same as before.

A concentration of 1:100 for 30 minutes proved fatal to rats and mice, and 1:150 proved fatal to mice only, the effects on other animals being in proportion to those noted for 1:80. All single exposures in small concentrations produced like effects.

From feeding rats with vapor contaminated food, the authors conclude that enough ethylene oxide was retained from an atmosphere filled with ethylene oxide by the foodstuffs (bread, butter, margarine, boiled fat bacon, cheese and oatmeal) to render them dangerous to health at least. No class of foodstuff has escaped suspicion entirely. When sprayed on food this substance is highly dangerous. Ethylene oxide injected intravenously in a fatal dose causes a drop in blood urea from normal 42 mg. per 100 c.c. of blood to 33 mg. per 100 c.c. Damage to kidney is sufficient to cause death.—W. J. Greaves Walker and C. E. Greeson, *Brit. J. Hyg.*, 32:409 (July), 1932.

Do Children Who Drink Raw Milk Thrive Better Than Children Who Drink Heated Milk?—During the past few years, raw milk advocates have contended that heating milk adversely affects its healthfulness and growth-promoting capacity, drawing their conclusions from experiments conducted at the Ohio State University, (*Jersey Bulletin and Dairy World*, Feb. 11, 1931), and the British National Institute for Research in Dairying (*Lancet*, Mar. 21, 1931). Extensive studies were made by the U. S. Public Health Service in coöperation with the health departments of ten states.

Studies were made of 3,700 children, ranging from 10 months to 6 years of age. There was no significant difference between the average weight of children who received no milk except raw milk for more than the latter half of their lives. The weights were 33.6 and 33.2 lb., the difference being in favor of heated milk. The heights were 37.5″ and 37.4″, the insignificant differences being in favor of heated milk.

There was no material difference between the two groups of children from the standpoint of the relative percentage of life during which various supplementary foods were included in the diet, except in the case of cod liver oil, which was included during an average of 41.6 per cent of the lives of the children receiving heated milk, and an average of only 27.6 per cent of the lives of the children receiving raw milk. This difference did not, however, affect the relative positions of the two age-weight curves significantly, since the average weight of the 636 children in the heated-milk group who received no cod liver oil at all was 33.5 lb. as compared with 33.8 lb. for the 794 children in

the heated-milk group who received cod liver oil during more than half of their lives. The parents of the children receiving predominately raw milk reported a higher incidence of diphtheria, scarlet fever, intestinal disturbances, and rickets than did the parents of the children receiving heated milk only.

The two groups of children were divided into 3 major race groups, Anglo-Saxon, Latin and miscellaneous, but the age-weight and age-height curves were not materially affected by the race distribution. It is concluded from this study that the growth-promoting capacity of heated milk plus the supplementary diet received by the average American child of 10 months to 6 years is not measurably less than the growth-promoting capacity of raw milk plus the supplementary diet received by the average American child of 10 months to 6 years.—Leslie C. Frank, F. A. Clark, W. H. Haskell, M. M. Miller, F. J. Moss and R. C. Thomas, *Pub. Health Rep.*, 47:1951 (Sept. 23), 1932.

INDUSTRIAL HYGIENE

The Manufacture of Linoleum—A historical and geographical introduction is made of the linoleum industry which in 1929 in the United States had 7 establishments, 5,544 employees and value of products amounting to $57,250,449. The gross sales in Canada amount to approximately $15,000,000 a year.

The actual plant conditions are described for two plants, particularly a description of the processes. The potential health hazards considered to exist consist of linseed oil (containing lead), cork dust and benzol, with a number of others described elsewhere in literature. There is also a job classification made which points out the chief hazards in each occupation in the industry.—Retail Credit Company, *Industry Rep.*, 7, 2: 11–21 (Feb.), 1932. E. R. H.

Some Dust Hazards of Industry, With Particular Reference to Silicosis—Also, **The Very Least an Employer Should Know About Dust and Fume Diseases**—The first of these is a 15 pp. pamphlet which summarizes from literature the chief features about siliceous dust and silicosis. The second is a small 8 pp. pamphlet devoted to the subject in the title with a further discussion of what constitutes reasonable care against the effects of dust and fumes. (These two pamphlets are commendable statements of the case by The Willson Products, Inc., manufacturers of respirators and protective equipments.)—Frederick Willson, M.D., Reading, Pa., 1932.

Safety in the Manufacture and Use of Acetylene—The paper describes technical processes in the manufacture and use of acetylene and the incidental accident risks, also legislative measures adopted in various countries for the prevention of accidents. Tests and experiments are included.—International Labour Office, World Peace Foundation, 40 Mt. Vernon St., Boston. 6 shillings. E. R. H.

Hardening Procedures and Upper Respiratory Disease (Common Cold)—Author's summary:

1. Over 300 adults were observed for 35 weeks from September 29, 1929, to May 31, 1930, when every effort was made to secure reports of all attacks of upper respiratory disease (common cold).

2. The group that during the winter slept with windows partially open, and the group

that slept with windows wide open showed no significant difference in respect of (a) frequency, and (b) severity of attack of upper respiratory disease (common cold). In respect of type of attack it was found that of the two groups the second (wide open windows) suffered relatively (a) fewer attacks with coryza and sore throat, and no cough (Cor+C—ST+), (b) more attacks with coryza, cough, and sore throat (Cor+C+ST+), and (c) more attacks with cough.

3. The group that exercised outdoors less than 8 hours per week in the summer, and the group that exercised 8 or more hours per week, showed no significant difference in respect of (a) frequency, (b) severity, and (c) type of attack of upper respiratory disease (common cold).

4. The group that exercised outdoors less than 4 hours per week in the winter, and the group that exercised 4 or more hours per week, showed no significant difference in respect of (a) frequency, (b) severity, and (c) type of attack of upper respiratory disease (common cold).—

William M. Gafafer, *Am. J. Hyg.*, 26, 1:233–240 (July), 1932. E. R. H.

Dermatitis and Compensation to Workmen—

Sir Vivian Hendersòn asked the Home Secretary whether there had been an increase or a decrease in the number of cases of dermatitis in the last 3 years for which compensation had been paid; and whether any steps were taken by his department to encourage the wearing of gloves or mittens in appropriate cases. Sir Herbert Samuel replied: "The Workmen's Compensation Statistics for 1928, 1929, and 1930 (which is the last year for which figures are available) show an increase in the number of cases. There were 1,170 cases in 1928, 1,405 in 1929; and 1,499 in 1930."

Various steps have been taken by the department to enforce or encourage the wearing of gloves as a precaution against dermatitis. For example, gloves are required for persons employed in various processes under the Chemical Works Regulations of 1922, and the Chromium Plating Regulations of 1931, and under the Welfare Order of 1918 for use of bichromate potassium or sodium in dyeing, the Hollow-ware and Galvanising Welfare Order of 1921, and the Tanning Welfare Order of 1930.

Further, a general leaflet providing information as to the causes of dermatitis and recommending precautions, including the use of gloves, has been prepared and widely distributed among occupiers of works likely to be affected, and, with a view of securing the coöperation of the workers, a form of cautionary notice which can be exhibited in the workrooms has been issued and put on sale through the Stationery Office. Reference is also made to the value of gloves in certain special memoranda dealing with the prevention of dermatitis in particular processes.—

Med. Off., 1232:100 (Mar. 5), 1932. E. R. H.

Air Conditions and the Comfort of Workers—The importance of air conditions to the comfort, health and efficiency of workers is stressed, while the temperature standards for comfort in relation to humidity and air movement are described for both winter and summer conditions.

The methods of measurement of physical properties of the air with an illustration of the sling psychrometer, the anemometer, and the kata-thermometer are given. "Conditioned air" is discussed and "effective temperature" while the latest designed "comfort zone" chart is exhibited and explained. There is a synopsis of the effects of high atmospheric temperatures on man, a brief description of the methods of removal of excessive heat and moisture and the nature of what constitutes "air cleanliness." — Policyholders Service Bureau, Metropolitan Life Insurance Co., New York, *Indust. Health Series* 5, 20 pp., 1932. E. R. H.

Carbon Monoxide, Acute and Chronic Poisoning and Experimental Studies—Authors' conclusions:

We admit that this is but a preliminary step in any study of this interesting subject but it does seem from our findings that CO is not rapidly eliminated from the body unless other measures than simple respiration of air are used.

It appears that in acute cases death is caused entirely by anoxemia and respiratory failure.

The body after death is capable, even after embalming, of absorbing sufficient carbon monoxide, when concentrated and with sufficient time of exposure, to produce all of the

macroscopic appearances and positive chemical findings of death due to this gas.

It is also possible to produce similar findings by injecting the body with either laked or whole blood, saturated with CO. These possibilities are of grave medico-legal importance.—

Thomas L. Ramsey and H. J. Eilmann, *J. Lab. & Clin. Med.*, 17, 5:415–427 (Feb.), 1932. E. R. H.

Bakers' Dermatitis from Activators Containing Persulphates—This illustrated article is summarized by the author as follows:

An outbreak of dermatitis among bakers employed as dough makers occurred in New South Wales in 1929–1930. Over 50 cases were recorded—about 1 man in every 20 of those employed in dough making was affected by a papuloerythematous rash of hands, forearms, arms, neck and sometimes the lower extremities and the groin which cleared up on leaving work but recurred on returning.

Cutaneous tests showed that individuals who suffered from or who had been affected by dermatitis were sensitive to ammonium persulphate, an ingredient of yeast foods, or activators used, and that they were generally of a susceptible or allergic type. Removal of persulphate from these activators practically abolished the incidence of the disease.—

Charles Badham, Studies of Industrial Hygiene No. 16, Section I.-E. *Report of Director-General of Public Health, N.S.W., for year ended Dec. 31,* 1930, 71–76. E. R. H.

The Printing Industry—The printing, publishing, and allied industries in the United States was composed in 1929 of 24,369 establishments employing 280,908 wage earners who drew wages of $596,142,000 and the value of products was $2,760,945,000. Canada has also an extensive industry in this line with Toronto as the center.

Hygienic conditions are described for several typical plants with a description of processes in type printing, lithography, rotogravure, steel engraving, and photo-process engraving.

A description of the potential health hazards includes excerpts from *Industrial Health-Hazards and Occupational Diseases in Ohio,* and from *Hygiene of the Printing Trades,* the latter a Bulletin of the U. S. Labor Statistics, 1917, by Dr. Alice Hamilton and Charles H. Verrill. Next follows a classification and an index of jobs which cites the chief health hazards of each. This is an industry involving accidents, noise, physical strain, monotony, sedentary work, postural hazards, glare and eyestrain otherwise, burns, acid burns, dermatitis and exposure to a considerable list of poisons depending upon the given process.—*Industry Report,* Retail Credit Co., Atlanta, Ga., 7, 3:23–37 (Mar.), 1932. E. R. H.

Lacquers and Their Hazards—The term " lacquer " is derived from the lac tree found in the East Indies. The present article is limited to coating products in which nitro-cellulose is the base. Such are also called pyroxylin lacquers. They are applied by the spray gun and dip tank, which have practically replaced the hand brush.

The ordinary lacquer contains 5 basic ingredients:

Nitro-cellulose (or nitro-cotton) gives waterproofness, hardness and durability to the coating.

Solvents and diluents for dissolving the nitro-cellulose and gums give quick drying properties, as well as preventing the finished film from blushing or turning white.

Gums or resins to thicken the coated film and add to its adhesive properties.

Softeners or plasticisers to overcome brittleness.

Pigments or coloring material to give color to the finish and also to reflect the actinic rays of sunlight, thereby making the coating more durable under outside exposure.

A diagram shows the percentage composition of an average lacquer—82 per cent of which is composed of volatile substances.

The amount of volatile matter constitutes the main hazard, with the diluents and solvents by far the most

important since these may consist of benzol, toluol, xylol, petroleum naphtha, and various olefine acetates, ethers, alcohols, etc. The evaporation rate of some of these is described as well as their toxic properties, some of which are cumulative. In addition, new solvents and combinations are constantly being placed on the market. There is a special discussion on ventilation and fire prevention.—William J. Burke, *Indust. Bull.*, New York Dept. of Labor, Albany, 11, 7:223–225 (Apr.), 1932. E. R. H.

Silicosis and the Industrialist—This article is by the managing director (technical) of Lever Brothers, Ltd., soap manufacturers, and discusses briefly points of historical interest as well as pathological features and other impressions brought out at the Johannesburg Conference in 1930.

In Great Britain the criterion of safety in the Workmen's Compensation Schemes goes no further than the composition of the mineral substance itself, e.g., the concentration of the SiO_2 therein is not referred to. Thus, the Refractories Industries Scheme does not apply if the mineral contains less than 80 per cent total silica. In the Sandstone Industry the figure is 50 per cent. In America it is customary to gauge the risk on the number of particles of free silica per cu. ft. of air, irrespective of the other constituents of the dust. In South Africa the total number of mineral particles per cu. ft. is taken as the basis. Thus international agreement as to methods of estimating is much to be desired.

The fact that finely ground silica enters into the composition of many widely used household articles (such as soaps and cleansers) broadens the picture. The equipment for protective purposes in the company's plant at Port Sunlight bulks more largely to the eye than the operating plant itself. No case of silicosis has yet occurred in any of the company's factories.—Horatio Ballantyne, *J. State Med.*, 40, 6:342–349 (June), 1932. E. R. H.

Silicosis in Pottery Industry—Mr. Wedgwood asked the Home Secretary the number of compensation claims made and the number granted, and the fatalities recorded, in the pottery industry since the silicosis order came into operation. Mr. O. Stanley replied: "I regret I have no information as to the number of compensation claims made, but the number of cases in this industry in which compensation was paid since February 1, 1929, when the Various Industries (Silicosis) Scheme came into operation, up to the end of 1931, is 322, including 87 fatal cases.—*Lancet* (London), 5681:160 (July 16), 1932.

E. R. H.

Asbestos Industry Regulations, 1931—This large sheet for posting in work places, etc., designates the industry and work processes covered, definitions, and duties. The latter refer in Part 1 to occupiers (employers), and in Part 2 to persons employed. There is a footnote referring to breach of regulations and the posting of same in conspicuous places.—Herbert Samuel, One of H. M. Principal Secretaries of State, Dec. 31, 1931. (Purchasable from British Library of Information, 270 Madison Ave., New York, price 1d. net.)

E. R. H.

Fibrosis of the Lungs in South Coast Coal Miners, New South Wales—Author's summary:

At the request of the Royal Commission on the Coal Industry in New South Wales (1929), a radiographic examination was made of the chests of a number of coal miners and a clinical examination of a smaller number.

A fine type of fibrosis of the lungs varying in degree from slight to marked was found to be present in 122 of 471 (25.9 per cent) coal miners examined and the incidence among

men who had worked on the South Coast coal-field only was 25.0 per cent.

This radiographic fibrosis was considered to be complicated by infectious processes in 49 of the 122 cases.

Radiographic appearances of tuberculosis in the form of an acute lesion, a latent process or an old scar, were found in 24 or 5.1 per cent of the 471 men examined.

It is concluded from the radiographic findings that a fibrosis of the lungs may be caused by working in coal mines of the South Coast, that the onset is slower and the disability less marked than from the disease produced in metalliferous mines and that the estimation of disability must depend less on radiographic findings than on clinical examination. This fibrosis of coal miners should be placed on a sound pathological and chemical basis.—

Keith R. Moore and Charles Badham, *Health*, Commonwealth Department of Health, Canberra, N. S. W., 9, 5:33–43 (including tables of radiographic examinations) (May), 1931. See also Section I.-E., Division of Industrial Hygiene, *Report of the Director-General of Public Health, N. S. W., for year ended Dec. 31, 1930*, pp. 67–68.

E. R. H.

Illness Among Button Workers—Five cases of a condition diagnosed as yellow atrophy of the liver recently occurred at Fort Madison (Iowa) among the personnel of a button factory, with 3 fatalities. A meeting of physicians disclosed, however, that a total of 16 cases had been reported since November, 1928, with 5 deaths. All the cases had occurred in men employed in the button factory during the winter months.

The work at the plant involved consists solely of sawing blanks from oysters and clam shells, which are shipped elsewhere to be finished into buttons. The shells are obtained from Texas, Mexico and Illinois.

At a meeting of the Fort Madison City Medical Society, it was generally agreed that in view of the absence of any tangible evidence of metallic poisoning, the disease must be considered of an infectious nature. Arrangements have been made for prompt removal to the hospital of the State University of Iowa if another case should develop.—*Medical News*, Iowa. *J. A. M. A.*, 99, 2:140 (July 9), 1932. E. R. H.

Tumors of the Skin Produced by Blast-Furnace Tar—From experimental procedures using mice and various samples of tar, the author found that tar obtained from a variety of blast-furnaces produces malignant tumors. It is less active than gas tars but its carcinogenic properties can be enhanced by extraction with ether. If applied too frequently, blast-furnace tar produces ulceration of the skin, but its toxic effects are not well marked, as some animals survive for 56 weeks.

It appears that workers in iron works do not handle the tar as do those in producers of gas, tar, pitch, and paraffin. This explains the absence of such tar tumors in the former.—Georgiana M. Bonser, *Lancet*, 5657:775–776 (Apr. 9), 1932. E. R. H.

The Health of the Women in the Hatters' Furriers Trade—No clear instances were obtained of the peculiar nervous conditions characterized by self-consciousness, shyness and irritability which feature mercury poisoning. However, in a group of 89 women, 8 complained of loss of weight, 7 of dyspnea, 6 of indigestion, 5 of sore throat, 4 with pains in muscles or joints, 4 with backaches, 3 of sleeplessness and 2 of marked fatigue. There were 7 cases that were considered as probably showing mild chronic mercury poisoning in the condition of the gums—purplish red or mauve discoloration. There were unfavorable effects from noise and a large proportion of abnormal conditions of the nose and throat, of overweight, constipation and dysmenorrhea.—Nelle Swartz, *Indus. Hyg. Bull.*, New York Dept. of Labor, May, 1932, pp. 266–267. E. R. H.

CHILD HYGIENE

THE PRESCHOOL CHILD

THE conviction is growing among public health administrators that health programs for the preschool child cannot well be conceived apart from the hygiene of infancy and maternal welfare. While it may be justifiable for various reasons to intensify first upon one phase of child hygiene and then upon another, in the end the whole field must be covered adequately as an integral part of the public health.

This fact is recognized fully by the Health Organization of the League of Nations, which has issued a comprehensive report on *Maternal Welfare and the Hygiene of Infants and Children of Pre-School Age*,* prepared by a special committee to deal with these questions. A previous memorandum issued by the League of Nations, *Enquiries Into the Causes and Prevention of Still-Births and Mortality During the First Year of Life*, has been very helpful in orienting us in this difficult sector of child life.

The present report is based on an analysis and comparison of the experience by different countries in the child health field. It emphasizes that "in considering questions of maternity and infant hygiene, it is important not to lose sight of the other branches of modern public health administration with which these are bound up."

Maternal welfare is considered under the following general heads:

Rate of Maternal Mortality
Maternal Morbidity
Causes of Maternal Mortality and Morbidity
Reduction of Maternal Morbidity and Mortality
Abortion and Contraception

* Obtainable from the World Peace Foundation, 40 Mt. Vernon Street, Boston, Mass. Price, $.50.

The opening paragraph on maternal welfare states,

> It is beyond doubt that many maternal deaths might be avoided and that much sickness might be prevented if it were possible to secure for all pregnant and parturient women adequate medical, nursing, and domestic attention. The prevention of obstetric disaster is not an altogether simple problem. It depends partly upon the professional skill of the doctor and midwife; partly on the provision of facilities, such as hospital accommodation, medical or nursing attention, etc., for the patient unable to secure these for herself; and to no small extent upon the willingness and intelligence of the patient in seeking and following such advice as is available for her.

Reduction of mortality and morbidity is summed up as follows:

> The causes of maternal mortality and morbidity being partly social and partly medical, it follows that measures which may serve to reduce sickness and death among mothers must be such as will improve the medical and nursing services for maternity, and will also educate the woman and her friends to realize the value of early, frequent and continuous supervision, careful treatment and efficient obstetric assistance. These measures may be divided into:
>
> (a) Medico-social enactments for the protection of maternity
> (b) The provision of facilities for supervision and treatment
> (c) A high standard of professional education for the doctor and midwife, so as to insure suitable obstetric attention
> (d) The education of public opinion

Especial attention must be given to the prevention and treatment of abortion if the maternal mortality rate is to be substantially lowered. The report succinctly states that,

> A threatened abortion often receives no proper medical attention, especially if the woman herself attempted to interrupt pregnancy, and the doctor is frequently not summoned unless acute septic infection intervenes.

Cases of abortion are not usually welcome in the maternity hospital because of their potentially septic character, and increased hospital accommodation is urgently needed for these cases, so that the uterus may be properly emptied if the abortion is inevitable, and suitable after-treatment provided. Instruction should be given at the prenatal clinic as to the dangers of abortion and the importance of seeking medical advice should it occur.

Infant welfare is discussed logically, beginning with measures directed toward the reduction of stillbirths and neonatal mortality which, despite all that has been done, remain unduly high.

Infant welfare is governed by certain general principles, though the precise measures taken to reduce infant mortality must be adapted to the existing customs, to the existing standard of public health, and to economic possibilities. In determining these principles, due account must be taken of the infant mortality rate in the district under consideration; the importance of this index was shown very clearly by the inquiry into infant mortality carried out in different countries in Europe and South America under the auspices of the League of Nations Health Organisation. A detailed study of the causes of stillbirths and infant mortality is contained in the reports drawn up as a result of this inquiry (*documents C.H.820 and C.H.908*[1]).

The following account is based on the experience gained in the course of that inquiry, and is intended for those countries, or rather those regions, having infant mortality rates approximating to the rates found in the districts covered by the inquiry; these rates vary from 50 to 200 per 1,000 (*i.e.*, 50 to 200 deaths under 1 year per 1,000 live births), and to these must be added stillbirths, varying from 23 to 64 per thousand live births.

Infancy must be protected against three main dangers: congenital and developmental defects, alimentary disturbances and infective disease. The first of these accounts for nearly all stillbirths and for deaths in the first 7 days of life, and as deaths in these two groups are generally attributable to similar causes, they may usefully be considered together. The other two conditions chiefly affect older infants. "Infection" covers acute or chronic infections, whether local or general, specific or otherwise, and in this connection diseases of the respiratory passages are most important. Lastly, alimentary disturbances cover deaths due to faulty methods of feeding, which may or may not be associated with disease of the digestive system.

Due consideration is given to preventive measures, nursing care, infant welfare centers, homes for mothers and babies, boarding out of babies, and milk. The statement concerning slum destruction is particularly timely.

The importance of slum demolition is by no means confined to the sphere of infant mortality, but nowhere is its urgency and its efficacy more apparent than in this particular field, urban and rural slums both playing the same fatal part. Cold, heat, darkness and the absence of ultra-violet rays have a disastrous effect on the infant's health.

From a constructive standpoint, it may be added that, in the towns, the erection of workers' tenements where the children are crowded together, thus increasing the risk of infection for the younger ones, is not as satisfactory as the establishment of garden cities, where infants can more easily be isolated—at least, to some extent.

A considerable portion of the report is given to the health of the preschool child. The dangers of this period are clearly pointed out. Problems of nutrition, dental hygiene, acute and chronic infections, accidents, and mentally abnormal children—all receive due consideration. Practical preventive measures are set forth in some detail.

The welfare of the child from its second year to its admission to school is not yet as a general rule organized to the same extent as that of the infant and of the school child. Even in those countries which have done most towards improving the health of children as a whole, the preschool age is still neglected, not so much because the importance of supervision at this age has escaped the attention of public health workers, but because of the difficulties, both theoretical and practical, which the protection of children of this age presents. The problems encountered in the campaign against morbidity and mortality during the preschool age are very different from those to be solved in infant welfare. Many, indeed, have not yet been solved from the scientific point of view, for example, the

prophylaxis of whooping cough, poliomyelitis, etc. Again, it is more difficult in practice to remain in touch with children of this age than with those in their first year; and the great majority still escape the attention of the health officer.

To undertake the effective protection of children of preschool age, the rate of morbidity and mortality for each year should first of all be established, with the help of reliable statistics, and the relative importance of the different causes of disease and death should be studied. The available statistics are largely inadequate and give no exact idea of the state of health during this period. The morbidity is only known in the case of the few infectious diseases which have to be notified, and even these notifications do not appear to be made in the same way in all countries. We are therefore compelled to use mortality statistics, which necessarily only give an imperfect idea of the condition of children's health.

The Final Report of the Departmental Committee on Maternal Mortality and Morbidity * of the Ministry of Health of England has appeared recently. It measures up fully to the high standards already set by the Ministry of Health and reflects great credit upon Sir George Newman, the Medical Officer of Health, and his distinguished confreres, who have brought their serious investigations to practical conclusions. The report is a model of clear-cut investigation and is presented in a form which is readily understood.

The main divisions of the report deal with methods of investigation, causes of maternal mortality, consideration of an adequate maternity service, statistical summaries, puerperal sepsis, and maternal morbidity. An instructive chapter is given to the maternity services of the Netherlands, Denmark, and Sweden, and another to the high maternal mortality in certain districts of England and Wales.

The underlying causes of puerperal deaths of 5,800 women have been carefully analyzed. The committee found that

> . . . the causes of death in these cases are of varied nature—clinical and social, administrative and economic—and are closely related one to the other. Thus, clinical errors are contributed to by economic conditions, and administrative measures are rendered nugatory by reason of ingrained social customs. A complete knowledge of all the circumstances in any case of maternal death is therefore necessary before apportioning blame to any individual or institution. We are, however, convinced that the primary essential for the reduction of a high maternal mortality is sound midwifery, before, during and after childbirth, and this does not chiefly depend upon administrative arrangements or the expenditure of public money. . . .
>
> False hopes would be raised if it were suggested that all maternal deaths are preventable. Changes in social life necessary to raise the standard of health and physical development of the women of the nation can come only with time; great advances in medical knowledge must be made before many of the risks of childbirth can be eliminated; even then the factor of human fallibility will remain.
>
> Nevertheless, we are confirmed in the opinion expressed in our Interim Report that at least half the deaths which have come under review could have been prevented had due forethought been exercised by the expectant mother and her attendant, a reasonable degree of skill been brought to bear upon the management of the case, and adequate facilities for treatment been provided and utilized.

This report should be read by every health officer, nurse, social worker, and especially by every obstetrician.

* Published by His Majesty's Stationery Office, Adastral House, Kingsway, London, W.C.2, England, 1932. Price 2 s. 6 d. Net.

PUBLIC HEALTH NURSING*

Institutes for Public Health Nurses—The rural nurse working alone is in great need of special institutes like those on social hygiene, mental hygiene, tuberculosis and the like, such as are given by some of the staff of the National Organization for Public Health Nursing. This nurse is a busy person and is constantly carrying on a planned program. At night she is too tired to read or study much. She needs a constant reminder that she must keep up with the latest methods of procedure in her job.

Oftentimes the nurse working alone cannot take time off to go to summer school or far off conventions. Too often, too, the problems that are worrying her are never mentioned in the professional magazines she reads. She would often be glad to take up a certain line of study if there were only reference books available.

Institutes are within the reach of every nurse because they require so little time for study at so small a cost. Given by well informed, sympathetic people who can draw out the nurses in discussion and answer their questions, they are invaluable.

After attending Violet Hodgson's institute for public health nurses on tuberculosis one nurse writes:

> I have been able more intelligently to help and assist those people who were trying to carry on a program, I knew what they were striving to do, I knew what to tell the patient, how to approach the patient with conclusions that were truthful, I knew better how to approach the doctors in charge, I knew better how to understand the danger of contacts, I knew the methods used in sanitariums for treatment and I could intelligently discuss them with the family when letters arrived from the patient about his treatment. I knew better how to stand by the family, advising and encouraging them to send letters of cheer to the patient. I knew and felt the attitude of the patient when he should arrive home and have to adjust himself to that let-down feeling. All this I found in the institute.—

Anne C. Rivers, How Much We Need Institutes, *Trained Nurse & Hosp. Rev.*, 175, 176 (Aug.), 1932.

In a Nutshell—The public has never scrutinized health department budgets as carefully as now. This means that some of the obsolete and outworn methods of procedure will have to go. There will have to be "more head work in health work" from now on.

Three questions the health officer and even the public health nurse should be able to answer about their communities are:

1. What is the crude death rate?
2. What is the infant mortality rate?
3. What is the typhoid fever death rate?

Physicians and public health nurses have spent too much time examining or inspecting school children and finding defects. The important thing is to get the defects corrected. More responsibility can be put on the teacher in school health work. Public health workers need to spend more time working with preschool children.

Public health officers and nurses need to bend their efforts to get *every individual under medical supervision*. Health work in the future will concern itself more with the prevention of heart trouble, diabetes, cancer and the like. To get at these we need to keep hammering away at periodical physical examinations.—C. E. Waller, M.D., Some Needs in Our Public Health Program of

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

Today. Notes from address delivered at the 1932 Annual Conference of Indiana State Health Officers.

The Nurse and the Public Library—The burden of much of the need for general health information in a community falls upon the public health nurse. Her contact with the people who are most in need of reliable information about proper living, proper nutrition, and the rudiments of the care of the sick is direct. She knows the need and her duty is to bring her people into contact with some reliable source of information. The spoken word is limited in its use. "The public library is the broadest of teachers—one may say the only free teacher."

What the public health worker may expect of her public library depends upon whether she takes the librarian into her confidence. Adequate and effective library collections on technical matters grow slowly; they are never ready made. The nurse and the librarian together should plan the public health collection for the community. With so much fine free health literature now available it is not difficult for the library to supply at little expense a good collection of pamphlets and leaflets to supplement books.

The Newark (N. J.) Public Library has the following to offer in the field of health education:

1. Professional books for nurses and health executives
2. Books for teachers giving methods of health education
3. Books for adults wishing information on nutrition, health habits, child care, and care of invalids; leaflets, documents and valuable clippings on all of these subjects
4. Books interesting to children, aiming to foster good health habits; health songs, poems, plays and stories
5. Posters and pictures from every possible source which are lent to schools, organizations and individuals to be displayed in all kinds of places

The health worker in an isolated rural field without library facilities near at hand may establish a small collection of documents or inexpensive leaflets to lend to her people. Or she can put them in touch with state or county library commissions. Sometimes book trucks bring collections to rural homes.

The nurse can create a demand for the type of book that will educate her public in health matters. She can recommend and advise in the selection of books which she thinks will meet the demand she has created.—Marie Louise Brush, The Public Library, *Pub. Health Nurs.*, XXIV, 9:468–9 (Sept.), 1932.

Two Services Combined in the American National Red Cross—In the twentieth anniversary year of both the Public Health Nursing Service and the Home Hygiene and Care of the Sick Service of the American National Red Cross, on July 1, the two services were combined into one, with I. Malinde Havey, R.N., as director. The merger consolidates the national direction of the two most important chapter activities of the American Red Cross, and the approach to both through field service, correspondence and reports will be simplified.—Public Health Nursing and Home Hygiene Combined in One Service, *Red Cross Courier*, XII, 2:48 (Aug.), 1932.

EDUCATION AND PUBLICITY*

An Explanation—With Regrets—Too many national and state meeting programs under way in September, plus emergency work in the fall money raising campaigns for health and welfare agencies, left no time for the preparation of copy for this issue of the JOURNAL—E. G. R.

"The Newspaper as a Social Agency"—An address, under this title, was a highlight on the program of the National Conference of Social Work at Philadelphia in June. Delivered by Sevellon Brown, of the *Providence Journal,* it presented a stimulating philosophy for the newspaper and for the social agency as seen by a newspaper man and good citizen. Believing that it should be read by all who seek the cooperation of the newspapers in spreading health and other welfare ideas, it has been published by the Social Work Publicity Council, 130 East 22d St., New York. *15 cents a copy.*

Said Mr. Brown:

> What appeals to me as a newspaper man, in facing you as social welfare workers, is that together we have loyalties to institutions so strikingly American.
>
> At a recent meeting of community fund workers in my New England home a visitor, recently returned from Europe, remarked that the spectacle there before him of 700 private citizens enrolled as canvassers, reporting gifts running into the hundred of thousands of dollars subscribed voluntarily year after year by private citizens to improve the social conditions and health of less fortunate individuals, could not be found in any country of the world outside the United States. It is true that social welfare work has been very highly developed under State auspices in Europe, but its voluntary and individualistic character with us is singularly American.
>
> So it is with the institution of the American newspaper. In many respects it has been developed in step with the press of other countries, but the commercial advertising basis upon which it rests in this country, and in which lies locked the secret of its character—its impulses to good and evil, its incomparable independence and impartiality in the vital function of disseminating news, its undeniable demagoguery and tendency to sensationalism, is decidedly idiosyncratic and peculiarly American.

Of course Mr. Brown should have included Canada in his second paragraph above.

"Behind the Front Lines"—This is the general title of a series of mimeographed bulletins issued by the Association of Community Chests and Councils, Graybar Bldg., New York.

They are intended for use in the local chest money raising campaigns this fall and winter. They include facts and figures, incidents and statements collected from many sources.

The series of 13 bulletins includes the following on health topics: Public Health Nursing, Tuberculosis, Hospitals, Nutrition, Mental Hygiene, Social Hygiene, and Child Health. They have gone to the chests, and some of the nationals have sent their special bulletins to their locals.

Single copies, *10 cents;* the whole series, *$1.00.*

Syndicated Health Columns—"*Editor and Publisher* Ninth Annual Directory of Features" lists the following: "Dr. Evans Health Column," by Dr. Evans; "Food and Health," by Dr. Shirley Wynne; "Health," by Dr. Morris Fishbein; "Health and Beauty," by Dr. Sophia Brunson; "Health Column," by Dr. Iago Galdston;

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

"Health, Heart and Home Page," by International Features Service; "Here's to Your Health," by Dr. Frank McCoy; "How to Keep Well," by Dr. W. A. Evans; "How's Your Health," by Dr. Iago Galdston; "Personal Health Service," by Dr. William Brady; "Pure Food Articles," by Dr. Royal S. Copeland; "Secrets of Health and Success," by Dr. Louis E. Bisch; "Your Child's Health," by Dr. Michael Shuman; "Your Health," by Dr. Logan Clendening; "Your Health," by Dr. Royal S. Copeland.

Then there are such "features" as: "Your Weight and Your Height" and "That Body of Yours," by Dr. James W. Barton; "How to Reduce Without Dieting"; "How I Keep My Figure"; "How I Keep Fit"; quite a group on parents, mothers, babies and children; groups covering food and home economics—most of which deal more or less with health.

When Advertising Is Health Education—In "The Judd Family," the Cleanliness Institute, 45 East 17th St., New York, has dramatized, in the form of historical fiction, two centuries of soap making in New England. Three episodes, selected at intervals of a century in the life of one family, point steps in the growth of progressive attitudes and daily practices of living with regard to cleanliness and sanitation. The focus is on the use of soap and the material has been primarily selected for the purpose of increasing interest in soap.

Teachers of upper elementary grades, who are seeking supplementary material on cleanliness, will find this story of soap making, with the accompanying bits of picturesque period information, definitely useful.—By a specialist in school health education. Copy of the pamphlet free to any health worker.

Health Division of National Conference of Social Work—The officers and newly elected members of the executive committee are nearly all concerned with health education:

Chairman—Albert H. Jewell, Kansas City, Mo.; *Vice-Chairman*—Virginia R. Wing, Cleveland; *Secretary*—Alice M. Hill, New York; *Members*—T. J. Edmonds, Des Moines; Howard W. Green, Cleveland; Bleecker Marquette, Cincinnati; Elba L. Morse, Marquette, Mich.; John Sundwall, Ann Arbor; Katharine Tucker, New York.

CUTTING COSTS

The whole range of department or association activities might well be checked by the full page of suggestions under "Short-Cuts and Savings," by Elwood Street. *Survey*, 112 East 19th St., New York. Feb. 15, 1932. *30 cents*. Two paragraphs which touch interpretation:

> Are you getting out a printed bulletin which might be done on the mimeograph? Are you getting out voluminous mail advertising which by judicious editing might be reduced in volume and cost and increased in readability? Are you getting out weekly bulletins which might be sent out bi-weekly?
>
> Are you planning far enough ahead in your work so that all details are cared for as they come up and the cost of last minute activities and hasty plans which have to be changed is eliminated?

BOOKS AND REPORTS

Psychology and Psychiatry in Pediatrics: The Problem. *Report of the Subcommittee on Psychology and Psychiatry of the White House Conference on Child Health and Protection—Bronson Crothers, M.D., Chairman. New York: Century,* 1932. 146 pp. Price, $1.50.

Unless the physician interests himself in child psychology, someone else will, is the thesis with which the report of the committee opens, and to which it clings through 43 pages of the book. "Psychiatry and psychology have opened a fascinating field of study involving the personality of the child," it is stated, and inasmuch as "at present the medical profession is regarded by most people as the natural source of advice," it is prophesied that "a practitioner of medicine who ignores the personality of the children under his care will find his position as a family adviser in definite danger."

It is admitted that the physician may have difficulty in sorting the grain from the chaff of experimentation, fact, differing beliefs, and vague ideas presented by the many works on psychology; however, "we are confident that among them are indispensable tools for medical men." It is suggested that not enough training, actually dealing with psychology, is given in medical schools. Suggestions for improving the quality of service rendered by physicians are offered on pages 30 to 32.

The differing attitudes of the psychologist, psychiatrist, and physician are discussed. The valuable services of the psychologist and psychiatrist are recognized, but it is believed that what they offer should be linked with medical training. "Obviously, it seems to us, doctors can acquire relevant psychological and educational attitudes and techniques more safely than psychologists and teachers can acquire adequate medical assets. Adequate medical care of the child cannot be given without intelligent attention to any intellectual and emotional difficulties which may be present."

Pages 44 to 60 are taken up with discussions of the report by psychiatrists, psychologists, pediatricians, mental hygienists, and others interested in its subject matter. Their comments add to the interest and value of the book. The greater part of the appendix presents information regarding the manner in which data for the report was secured, and the manner in which typical groups such as the Merrill-Palmer School, the Child Guidance Institute, and the Essex County Juvenile Clinic of New Jersey are operated.

The Psychiatric Social Worker's viewpoint, as expressed in reply to the questionnaires used by the committee, is presented.

The book is interesting reading for either professionals or laymen.

STELLA RANDOLPH

Directory of Clinics and Health Stations *(Reprinted from Directory of Social Agencies, New York, 1932, pp. 433–661). Published by the Charity Organization Society in cooperation with the Welfare Council. Reprints from New York Tuberculosis and Health Association, New York, N. Y.* Price, $.40.

This handy little volume makes available an up-to-date list of clinics and health stations in New York City. There are four divisions to the book—baby health stations, clinics, mental hygiene, and pre-school and nutrition

clinics. The name of the clinic is listed, together with the address, telephone number, the name of the director, clinic hours, and fee, if any. Under the section devoted to this subject, clinics are listed alphabetically by types of service rendered. The arrangement of clinics by boroughs adds to the usability of the directory. A list of hospitals and clinics, with telephone numbers, appears in the front of the book, and there is also a reference index.

A table showing the distribution of clinics and health stations by boroughs is an interesting feature of the book. Of the 1,751 in New York City, 1,024 are in Manhattan, 178 in the Bronx, 412 in Brooklyn, 93 in Queens, and 44 in Richmond. ALMA W. FRAAS

Milk Production and Control, A Publication of The White House Conference. *Report of the Committee on Milk Production and Control, H. A. Whittaker, Chairman. New York: Century,* 1932. 392 pp. Price, $3.00.

This volume should be one of the most correct and interesting of the series to which it belongs. It is written by four sub-committees, each of which had a Board of Advisers. It contains a great deal of useful material, though it shows some of the unevenness which might be expected from the number of authors concerned. It ends with two appendixes, one on Safe Milk for the Farm Family and the other on Research in Progress on Nutritional Aspects of Milk.

The most disappointing section is that on Diseases Transmitted Through Milk. Judging from the references most of the alleged facts are taken from a publication of the White House Conference in 1931, *Communicable Disease Control.*

Two pages and a half are given to bovine tuberculosis which show a lamentable lack of knowledge of the history of this subject. Theobald Smith first showed the difference in types of tubercle bacilli in 1896 not 1898. These differences were studied by the Royal Commission on Tuberculosis in England and the Imperial Commission in Germany. The text gives them as having been done by the British Commission and at the Gesundheitsampt in Berlin. It is hard to understand why an American publication, particularly one of this type, should wish to give credit to European rather than to American work. The laboratory of the State Live Stock Sanitary Board of Pennsylvania made its report in 1902, more than 2 years before either the Royal or the Imperial Commissions, which confirmed its findings, while the New York City board of health did not make its report until 1910.

This section gives a very old quotation from Theobald Smith, which would lead one to believe that bovine tuberculosis was transmitted to children only when large numbers of bacilli were put into the system, as in udder tuberculosis, or under "certain unknown favorable conditions." This last statement may be accepted, for the fact is that no one knows the conditions under which bovine tuberculosis is transmitted to human beings. The whole tendency of this section, as well as of the first appendix, is to belittle the danger of bovine tuberculosis to human beings, although on page 369 it is stated that in some regions one-fourth of all cases in children under 16 are of bovine origin.

This volume appeared just about the time that we had the report of the Committee on Prevention and Research of the International Crippled Children's Society, and that from the committee of sixty from the People's Health League in England, the first showing that 10 to 15 per cent of bone and joint tuberculosis was bovine in origin, and that of children 0–5, 21 per cent, and of those 5–16, 26 per cent, were bovine infection, while the English Commission

reports that 2,000 deaths and 4,000 new cases occur annually in that country from bovine infection.

The fallacy of Theobald Smith's statement concerning udder tuberculosis is shown by the official figures. In England, where cows suffer from tuberculosis up to 40 per cent only 0.2 per cent, as revealed by autopsy, have udder infection. In America where the general percentage of tuberculosis is estimated at 1.9 per cent—though it runs higher in dairy districts—post-mortem examinations of animals slaughtered on account of tuberculosis show only 0.1 per cent of udder lesions.

While the book contains much useful information, many of the references are very old and it is impossible to consider it up-to-date or an entirely reliable guide, as it should be.

MAZYCK P. RAVENEL

A System of Bacteriology in Relation to Medicine. Vol. VIII—*By W. Bulloch, L. Colebrook, J. Cruickshank, et al. London: H. M. Stationery Office,* 1931. 390 pp. Price, $6.00.

Volume VIII of this system covers a wide field. The chapter on fungus pathogenic to man is presented so as to stress the difference in outlook of the mycologist and the bacteriologist. No attempt is made to give a summary of the literature but rather to suggest—the author states—as to how precise knowledge can be obtained. It has therefore considerable value. The *Phycomycetes, Ascomycetes, Fungi Imperfecti* and the Ringworm group are individually thus considered.

The chapter on *Actinomycosis* and similar conditions is given under three chief divisions, the aerobic actinomyces, the anaerobic actinomyces and actinibacillosis. The chapter on the pathogenic *Leptothricex* shows how unsuccessful the attempts to define their morphology and physiology have been, in spite of their wide distribution. The difficulty encountered is due to the inability to use artificial culture methods with success.

The largest part of the volume is devoted to spirochetes and diseases caused by them. Excellent drawings of the various spirochetes are given. The blood spirochetes of the relapsing fever type have found in the blood of man in most parts of the world with the exception of Australia, and have been given various designations, but the author states that they all belong to one widely distributed species. In the chapter on syphilis the various diagnostic tests are well discussed.

Chapters on leptospiroses, yaws, the normal bacterial flora of man and swine erysipelas are included. Each chapter contains a short bibliography.

The treatment of the subject is very uniform, and this volume maintains the high standard set at the beginning for the series. ESTHER W. STEARN

Habits for Safety: A Text-Book for Schools—*By Gentles and Betts. Indianapolis: Bobbs-Merrill,* 1932. 228 pp. Price, $.67.

This is an excellent text for teaching safety practices and developing safety habits. That is the primary purpose of the book and it fulfils it better than anything that has come to our attention. It is intended primarily for children 10 to 14; although adults would do well to read it. It is full of helpful suggestions and useful information.

The subject matter in the text is well chosen, and presented in a manner so it can be used in a variety of ways by teachers. It can be made a part of the general course in health and hygiene or given as a special course in safety instruction. It may be correlated with instruction in other subjects in the curriculum or the material used for working out safety projects. That feature combined with well chosen subject

matter makes the book especially valuable.

The first part of the text emphasizes the importance of developing habits for safety as a basis for successful living, and it does so without attempting to lecture to the children on the subject. A series of chapters call attention to common accidents in the home, the school, the city streets, the farm and in the workshops and suggest practices necessary to prevent such accidents. The last part of the book gives instruction in first aid procedures for the injured.

The book deserves the highest recommendations as a text for promoting safety habits and practices among children. WILLIAM DEKLEINE

A Textbook of Bacteriology—*By Kenneth L. Burdon. New York: Macmillan,* 1932. 108 pp. Price, $2.75.

This textbook of bacteriology is designed particularly for the use of nurses who have had more than the minimum amount of training acceptable in nurses training schools of non-university grade. In writing this book the author has presented the subject of bacteriology in non-technical language and has attempted to show the relationship to preventive medicine and hygiene. It appears that he has succeeded remarkably in making such a complex subject as bacteriology understandable to a group of students who do not usually have the prerequisite training in chemistry necessary to the understanding of the more fundamental aspects of bacteriology as we know it today.

This volume is distinctly different from most other textbooks of bacteriology. It has little space devoted to bacterial classification, which detracts from the general interest of the subject for many beginning students. The specific organisms concerned in infectious processes are considered from the standpoint of the regions of the body which are infected. Along with this consideration of the organisms the author discusses the normal flora of the body. One cannot but question, even in a textbook for nurses, the author's statement that *Blastomyces hominis* is a kind of yeast. The printing and make-up of the book are excellent.

NEWELL R. ZIEGLER

The Criticism and Improvement of Diets *(Memorandum to the Minister of Health). London: H. M. Stationery Office,* 1932. 14 pp. Price, $.10.

This is an excellent review of nutrition by the Advisory Committee to the Ministry of Health. It may be summed up in the following conclusions:

> To be satisfactory the diet must yield 3,000 calories per day per "man" and contain 37 grammes of animal protein. Women and children need proportionately less. The relations of protein, fat and carbohydrate must be satisfactory.
>
> It must also supply mineral matter (of which calcium, phosphorus, iron and iodine are the most important elements) and vitamins A, B, C and D (of which the most likely to be lacking is D, followed by A and then C).
>
> These are best supplied in the "protective foods," *i.e.*, milk and milk products, fish (especially fat fish and fish roes), liver, eggs, fresh fruit and fresh salad vegetables.
>
> Only when the diet satisfies all these essentials can it be considered satisfactory. No defect in one essential can be compensated by excess in another.

MAZŸCK P. RAVENEL.

The Principles of Animal Hygiene and Preventive Veterinary Medicine—*By Leunis Van Es, V.S., M.D. New York: Wiley,* 1932. Price, $6.50.

This book is written by an American author and is the first one of this nature to appear in the United States. It is a valuable addition to literature on the subject, written by a man of wide experience and education in animal hygiene and preventive veterinary medi-

cine. Such a book has long been needed and is a welcome addition to the knowledge of preventive veterinary medicine. It is the product of a combined experience, thought, and judgment rarely found in veterinary literature.

The importance of a book on preventive animal hygiene is emphasized when one considers the interrelation of human and animal diseases. Quite a number of diseases affecting the lower animals are transmissible to man, and have caused many fatalities in the human family.

The first part of the work deals in a masterful way with the principles and practical details of disease prevention as applied to the farm and farm animals; the latter part discusses the individual infectious and parasitic diseases of animals, and gives the latest essential information in regard to each that is of value in applying preventive measures.

Another thing that adds to the value of the text is that the author has selected references to each chapter for those who desire to pursue the topic in greater detail.

In this text we have usable information on important veterinary matters and Dr. Van Es is to be congratulated on his presentation of the subject.

A. J. DURANT

Diabetes—*By Elliott P. Joslin. Cambridge: Harvard University Press,* 1931. 70 pp. Price, $1.00.

The 18th volume of "Harvard Health Talks" is written by an eminent authority. It tells us of that disease which has probably yielded to man's efforts more than any other during recent years. The author says:

> To have claimed 9 years ago that a knowledge of the disease and how to control it would enable one to prevent diabetic coma would have exposed one to ridicule. Whereas all diabetic children at that period died of coma, today this complication is exceptional, and almost invariably due to ignorance or gross carelessness.

The book is divided into two parts, Individual Control, and State Control. To read one is to read the other—and both should be read by everyone, diabetic or otherwise. From the first, one gets the inspiration that possibly the individual may sometime learn to evaluate his medicaments, for the author says:

> It is unfortunate that the worthlessness of quack medicines in all diseases cannot be tested as readily by the patient as in diabetes, because if this were the case the cost of medical care in the United States would be reduced by millions of dollars.

From the second we learn that public health concerns things other than infectious diseases—and that diabetes is on the increase.

C. F. ADAMS

The Business Man and His Health—*By Jesse Feiring Williams, M.D. New York: McGraw-Hill,* 1932. 175 pp. Price, $2.00.

When, if ever, a business man sets forth on a literary pilgrimage in quest of the salubrity which most industrialists are erroneously thought to lack, he craves entertainment and inspiration as well as information. From this book, if he could be induced to read it, a business man might derive much healthful information, but he would secure from it but little, if any, amusement, recreation, or excitement. It requires more than an occasional witticism to offset continuous dullness, and this book is distressingly prosaic.

Included in it are such inevitable topics as health examinations, the functions of man, vacations, hobbies, exercise, "muscles and mussels," mental hygiene doctors, the perennial bromide —"the tired business man"—few of whom are ever actually overcome by lassitude, and a pun on the same subject—"the retired business man." None of it is calculated to overcome the inherent sales resistance of the average American mercenary, despite the fact

that most modern business men ought theoretically to have plenty of time now for reading. They require something more thrilling than this.

JAMES A. TOBEY

Journal Southeastern Section American Water Works Association, Proceedings of Fourth Annual Meeting, Atlanta, Georgia, Vol. 2, No. 1, 1932.

This journal publishes the papers presented at the Fourth Annual Meeting of the Southeastern Section of the American Water Works Association, held at Atlanta, Ga., March 22–24, 1932. Many papers of general interest included "Advances and Developments in Powdered Activated Carbon" by F. E. Stuart; "Our Streams and Their Flow" by E. D. Burchard; "Information on Water and Sewage Works Problems—Where It Can Be Found" by Linn H. Enslow; and "Some Trends of Municipal Sewage Disposal Practice" by Wellington Donaldson. Other papers presented were "Turbidimeters in Use at the Atlanta Filtration Plants," "Wells and the Part They Play in Our Water Supply," and "Water Works Accounting." Descriptions are given of the water softening plant at Thomasville, Ga., and of the water supply of Spartanburg, South Carolina.

VINCENT B. LAMOUREUX

Population Characteristics by Census Tracts, Cleveland, Ohio, 1930—*By Howard Whipple Green, with a foreword by Leonard P. Ayres. Cleveland: The Plain Dealer Publishing Co.*, 1931. 236 pp. Price, $25.00.

This volume contains a comprehensive analysis of the population of Cleveland, by census tracts and of 4 adjoining cities, according to age, sex, nativity, economic, social, and other factors. The first 72 pages are devoted to many valuable charts, graphs, maps, and general tables with descriptive text, and illustrate how any city may, with the cooperation of the U. S. Bureau of the Census, which provided the basic data, study systematically its local problems relating to the people. The balance of the volume presents the detailed statistics by census tracts and an index map.

In bringing these exhaustive census data together, supplemented by additional material for 252 census tracts of the 5-city area, the author has rendered a most valuable service. The illustrations of various methods of applying census tract data to local problems are helpful to those who wish to study the economic, social, and health problems of a city on a district basis. As stated in the foreword, "The possibilities of the use of this material as a guide in all economic, social, and health programs are limitless, and the analysis of material is so carefully developed that even to one unacquainted with statistics, the basic facts stand out."

IRA V. HISCOCK

Classic Descriptions of Disease. With Biographical Sketches of the Authors—*By Ralph H. Major, M.D. Springfield, Ill.: Thomas*, 1932. 630 pp. Price, $4.50.

Members of the medical profession, regardless of whatever specialty they may practise, owe a debt of gratitude to Dr. Major for this work, which represents an enormous amount of research, judgment in selection, and a great deal of work in translating articles from the languages in which they were written. There are 376 selections from original texts written by 179 authors, and 130 illustrations, many of which are ususual portraits, facsimiles of title and text pages, reproductions of apparatus and drawings, etc., all of which are excellent and full of interest.

The arrangement leads to some duplication. The selections are grouped under 10 heads, with the particular condi-

tion or disease and the authors of the papers placed under these heads. We would like to suggest some rearrangement. For example, under Infectious Diseases, sub-heading Tuberculosis, are 2 pages by Laënnec on Physical Signs of Tubercles, while under Diseases of the Digestive Tract, more than 500 pages further on in the book, we find his photograph, a brief sketch of his life, and the description of mediate auscultation, and the discovery of the stethoscope. Laënnec owes his fame more to this discovery than to any other one thing, though everyone recognizes him as a master of medicine. The quotation in this latter place concerns cirrhosis of the liver, to one type of which he gave his name, but he describes the case as "Hemorrhagic pleurisy of the left side, with ascites and organic disease of the liver," and it is found in his treatise on auscultation. One extract from his writings is also found under Diseases of the Circulatory System, and four under the head of Respiratory Diseases.

In the preface the author properly calls attention to the study of medical history urged by Sir William Osler. Another of our great teachers, Dr. Victor C. Vaughan, also insisted on the historical method of teaching. Some of our schools have introduced courses on the history of medicine, but we know of no other book which not only gives the biography of the masters of medicine, but also the selections from their writings which are most famous as well as useful. The average physician, even in cities of considerable size, does not have a library at hand which contains the originals of anything like the material here given. Everyone who has taught medicine knows that the average student is densely ignorant even of the names of those founders of medicine which should be as familiar to him as his own. Here in one volume, the author has given us the story of 179 men who have played a leading part in the development of medical science as we know it today. He has not confined himself to men of old, but has included quite a number of those now living. It is something of a disappointment not to find the names of men like Koch, Schaudinn, Kitasato, Bordet, Wassermann, Klebs, Metchnikoff, Loeffler, and others. These have been purposely omitted because their discoveries were bacteriological, while the field of the book is chiefly clinical medicine. We miss also such names as those of Oliver Wendell Holmes and Semmelweis, though certainly the investigations on puerperal fever by these two men concern clinical medicine directly.

These are suggestions rather than criticisms. The book as a whole fills us with admiration, not only on account of its contents, but also because of the enormous amount of well considered and well directed energy which the author has shown. It is one of the most useful which has been published for a long time, and deserves a wide circulation not only among physicians in general and libraries, but also as a textbook in medical schools. The printing and make-up of the book are excellent, though there are a number of typographical errors. It is printed on very heavy paper, perhaps because of the large number of illustrations. We congratulate both the author and the publisher on this piece of work.

MAZŸCK P. RAVENEL

Hygiene of Community, Home and School—*By E. W. Steel and Ella G. White. New York: Harper,* 1932. 386 pp. Price, $2.25.

In emphasizing health knowledge as an adjunct to good citizenship the authors present their subject matter in a new light. The book contains 23 chapters and includes numerous illustrations, charts, pictures, and diagrams. It covers the entire field of public health as it appeals to, and can be absorbed by,

the student in teachers' colleges or other colleges offering courses in this field. Public health officials will also be interested in the method of approach.

Besides chapters on milk, water, excreta disposal, plumbing, rodent control, insect control, and food protection, the book also discusses the economics of health, the activities of health departments, child and maternity hygiene, and the importance of light and ventilation with reference to health. The legal aspects of public health work are covered in a separate chapter. This new book thus provides ideal material for college health courses.

ELLA G. WHITE

Quantitative Clinical Chemistry—*Vol. I, Interpretations—By John P. Peters and Donald D. Van Slyke. Baltimore: Williams & Wilkins,* 1931. 1,264 pp. Price, $12.00.

This volume was begun about 7 years ago. In it and the companion volume on methods the clinician and the biochemist have joined hands to produce what appears to be the most comprehensive and authoritative book on the subject in this country. The names of the collaborators need no introduction.

In their preface, the authors inform us that the collaboration is a close one; scarcely a paragraph escapes being the joint work of both men. The intention in the discussions is to treat " those substances which are of importance in clinical medicine and for the determination of which suitable methods are available."

The general plan of the book gives the physiological rôle of the substance under discussion, followed by a consideration of its significance in diagnosis and therapy. The physiological sections fill more space than the clinical application, " because the disease processes are only special examples of extreme functional disturbances," and " because so little is known of the changes in disease of some of the substances considered."

Only occasionally is more than passing notice given to historical considerations, such as under glucose. However, full bibliographies are given at the end of each chapter which total over 4,000 references and serve as an excellent and convenient key to the literature of this important field. The book undoubtedly will stand at the head of the list of publications on this subject.

C. F. ADAMS

Quantitative Clinical Chemistry—*Vol. II, Methods—By John P. Peters and Donald D. Van Slyke. Baltimore: Williams & Wilkins,* 1932. 957 pp. Price, $10.00.

To the laboratory man, this is the most important publication for many years. It is full of methods and procedures applicable to any laboratory, and replete with material not found in any other manual.

Fortunately for the non-chemist, Chapters I and II concern general chemical technic and special biochemical technic. These occupy 83 pages and deal not only with fundamentals but with many simple dodges and handy procedures that every laboratory worker needs.

The authors have followed the general plan of describing methods of different types for each substance, thus enabling any worker to choose according to his needs or tastes. This includes a gravimetric, a titrimetric, a colorimetric and a gasometric procedure when desirable methods for each were available with, if advisable, macro and micro forms. Each chapter is prefaced with a discussion of the principles on which the methods are based, drawn in such a way that the discussion serves as a guide to the literature.

While there is more or less grouping of procedures for the determinations of any given substance, gasometric methods for sugar, urea, etc., etc., are not

placed in the chapters concerning these substances, but are gathered into a chapter by themselves. It is interesting to note that some of the details of the gasometric methods in Chapter VII are somewhat in advance of the original descriptions.

The authors have added an appendix for methods not strictly within the scope of quantitative analyses as here presented, though used in clinical laboratories. They include such procedures as concern renal and hepatic function tests, bile pigments in blood, plasma, etc. As in the companion volume, each chapter is concluded by a useful bibliography. The volume ends with an author index and a subject index.

One dislikes to call attention to insignificant typographical errors in such a good book, but the publishers' " Sans Tache " should be better guarded. For instance, pages 9, 61, 217, 508, and 571 have errors and others could be cited. Upon the whole, nothing on methods has come off the press in recent years comparable to this volume.

C. F. ADAMS

Proceedings of the Ninth Annual Short School, Texas Public Health Association, November 9–14, 1931.

The Texas Association of Sanitarians, now the Texas Public Health Association, affiliated with the American Public Health Association, held the largest and most successful Short School of its career at Houston, Tex., November 9–14, 1931. The Proceedings are divided into 4 sections, the first including a summary and registration list, and the second a group of papers relating to medical and administrative public health, including the subjects of tuberculosis prevention, diphtheria protection, vital statistics, health work of the Shriners, significance of the U. S. Chamber of Commerce health contests, school superintendents and health work, new physical education law and health education, and the need of a new sanitary code for Texas.

Papers presented in the third section on nursing and sanitation include itinerant nurse services, science of sanitation, sanitation in industry, military sanitation, prison sanitation, a malaria control program for Texas, importance of a national unified milk sanitation program, the new Arizona dairy law, and oyster sanitation. The fourth and last section is devoted to papers relating to the laboratory, including a description of the State Hygienic Laboratory, bacterial counts of milk methods, practices causing errors in the Babcock test, thermophilic bacteria, and operation of the Texas standard milk ordinance program.

VINCENT B. LAMOUREUX

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Weather and Pneumococci—Pneumococcus incidence in normal throats was highest in inclement weather. In some cases, there was an association between respiratory infections and Group IV pneumococci. Note the length of the title.

BROWN, M. H. and ANDERSON, E. A further Bacteriological Study of the Bacterial Flora of the Throat of Normal Persons and Persons with Minor Respiratory Infections with Especial Reference to Pneumococcus. J. Prev. Med. 6, 5:407 (Sept.), 1932.

Typhus Fever—Evidence is presented establishing two manifestations of typhus; the highly communicable form is louse-borne, whereas the endemic form is transmitted from rat to man by fleas and not from man to man except

in lousy populations. Lice, ticks, mites, and other "insects" may possibly transmit the disease from rat to rat.

DYER, R. E. *et al.* Endemic Typhus Fever of the United States. J.A.M.A. 90, 10:795 (Sept. 3), 1932.

Is Raw Milk More Nutritious Than Pasteurized?—"The growth-promoting capacity of heated milk plus supplementary diet received by the average American child of 10 months to 6 years is not measurably less than the growth promoting capacity of raw milk plus the (same) supplementary diet." This exact and somewhat stilted statement summarizes a statistical study of growing youngsters in answer to the raw milk propaganda. However, the same propaganda will rise superior to the mere enumeration of statistics no matter how exact may be the control.

FRANK, L. C. *et al.* Do Children Who Drink Raw Milk Thrive Better Than Children Who Drink Heated Milk? Pub. Health Rep. 47, 39:1951 (Sept.), 1932.

Seasons for Colds—Statistical evidence of the conclusions based upon common observation that colds are generally less prevalent from April through August, with a "low" late in July or early in August, and high in prevalence from September to March inclusive.

FROST, W. H. and GOVER, M. The Incidence and Time Distribution of Common Colds in Several Groups Kept Under Continuous Observation. Pub. Health. Rep. 47, 36:1815 (Sept. 2), 1932.

Drill Dust Removal—Dust removed by exhaust from rock drills not only protects the operator but improves the speed of the drill at small cost.

HATCH, T. *et al.* Control of the Silicosis Hazard in the Hard Rock Industries. J. Indust. Hyg. 14, 7:246 (Sept.), 1932.

Tonsillectomy and Health—"Excellent end-results in selected cases have been statistically over-weighted by indifferent end-results in cases in which the operation has been performed without sufficient indications as a more or less routine prophylactic ritual. In our opinion, a large proportion of the tonsillectomies now done on children are unnecessary, entail some risk, and give little or no return." Thus concludes a British study.

GLOVER, J. A. and WILSON, J. The End-Results of the Tonsil and Adenoid Operation in Childhood and Adolescence. Brit. M. J. 3740:506 (Sept. 10), 1932.

Staphylococcus Dissociation—Demonstrating a filtrable form of *S. aureus*, probably a cyclo-stage, during which the organism is avirulent, the authors offer the suggestion that this may explain how the organism lurks in the body without manifestations only to appear in lesions later when virulence returns.

HOFFSTADT, R. E. and YOUMANS, G. P. *Staphylococcus Aureus:* Dissociation and Its Relation to Infection and Immunity. J. Infect. Dis. 51, 2:216 (Sept.-Oct.), 1932.

Compulsory Smallpox Vaccination Heresy—British health officials in this symposium frankly question the wisdom of compulsory vaccination in Great Britain in the absence of the severe type of smallpox.

LEDINGHAM, J. C. G. *et al.* Vaccination. J. Roy. San. Inst. 53, 3:134 (Sept.), 1932.

British Maternal Mortality—Frank, though not new, is this discussion of the causes of maternal and infant deaths in England. The important factors of sepsis, abortion and illegitimacy are given the consideration they deserve.

MCILROY, L. The Prevention of Maternal and Infant Mortality. J. State Med. 40, 9:497 (Sept.), 1932.

Settlements for the Tuberculous—Papworth Village is cited as evidence of the value of and need for a system of tuberculosis settlements throughout Great Britain. It would seem that the

same conditions hold true this side of the Atlantic as well.

VARRIER-JONES, P. Tuberculosis Settlements. J. State Med. 40, 9:536 (Sept.), 1932.

Experiments With Poliomyelitis—In a series of three papers, the author presents evidence of a toxic factor in the stools of poliomyelitis patients which, when injected into guinea pigs, causes conditions strikingly like those found in human patients. This virus can be neutralized by previous injection of convalescent serum.

TOOMEY, J. A. Demonstration of a Toxic Factor in the Stools and Urines of Poliomyelitis Patients. J. Prev. Med. 6, 5:379 (Sept.), 1932.

Adult Hygiene—Heart disease, pneumonia, tuberculosis, and student and industrial health are discussed in a stimulating Canadian symposium.

OILLE, J. A. *et al.* Adult Health. Canad. Pub. Health J. 23, 9:403 (Sept.), 1932.

BOOKS RECEIVED

BEHIND THE DOOR OF DELUSION. By "Inmate—Ward 8." New York: Macmillan, 1932. 325 pp. Price, $2.00.

THE MODERN HOSPITAL YEAR BOOK. 12th ed.—1932. Chicago: Modern Hospital Pub. Co., 1932. 707 pp. Price, $2.50.

HANDBOOK OF BACTERIOLOGY. 3d ed. By Joseph W. Bigger. Baltimore: Williams & Wilkins, 1932. 459 pp.

POPULAR SCIENCE TALKS. Edited by Ivor Griffith. Philadelphia: Philadelphia College of Pharmacy and Science, 1932. 319 pp. Price, $1.00.

INDUSTRIAL PSYCHOLOGY. By Morris S. Viteles. New York: Norton, 1932. 652 pp. Price, $5.50.

THE CRISIS IN HOSPITAL FINANCE. By Michael M. Davis and C. Rufus Rorem. Chicago: University of Chicago Press, 1932. 241 pp. Price, $2.50.

TREATMENT OF SYPHILIS. By Jay F. Schamberg and Carroll S. Wright. New York: Appleton, 1932. 658 pp. Price, $8.00.

MAGAZINE PUBLISHING. By Lenox R. Lohr. Baltimore: Williams & Wilkins, 1932. 328 pp. Price, $4.00.

WATER PURIFICATION CONTROL. By Edward S. Hopkins. Baltimore: Williams & Wilkins, 1932. 131 pp. Price, $1.75.

EPIDEMIOLOGY: HISTORICAL AND EXPERIMENTAL. The Herter Lectures for 1931. By Major Greenwood. Baltimore: Johns Hopkins Press, 1932. 80 pp. Price, $1.50.

HOUSING AND THE COMMUNITY—HOME REPAIR AND REMODELING. Washington: President's Conference on Home Building and Home Ownership, 1932. 291 pp. Price, $1.15.

READINGS IN EDUCATIONAL SOCIOLOGY. Vol. I. Edited by E. George Payne. New York: Prentice-Hall, 1932. 376 pp. Price, $3.00.

BENZOL (BENZENE) POISONING. By Cary P. McCord and Associates. Cincinnati: Industrial Health Conservancy Laboratories, 1932. 84 pp. Price, $2.00.

THE CURATIVE VALUE OF LIGHT. By Edgar Mayer. New York: Appleton, 1932. 175 pp. Price, $1.50.

PROHIBITION—A NATIONAL EXPERIMENT. Edited by James H. S. Bossard and Thorsten Sellin. Philadelphia: American Academy of Political and Social Science, 1932. 269 pp. Price, $2.50.

HOSPITALS AND CHILD HEALTH. Publication of The White House Conference. New York: Century, 1932. 279 pp. Price, $2.50.

WATER ANALYSIS FOR SANITARY AND TECHNICAL PURPOSES. 2d ed. By Herbert B. Stocks. Philadelphia: Lippincott, 1932. 135 pp. Price, $3.50.

MASSAGE AND THERAPEUTIC EXERCISE. 3d ed. By Mary McMillan. Philadelphia: Saunders, 1932. 359 pp. Price, $2.75.

FUNDAMENTALS OF PERSONAL HYGIENE. By Walter W. Krueger. Philadelphia: Saunders, 1932. 291 pp. Price, $1.75.

REFERENCE HAND-BOOK FOR NURSES. 7th ed. By Amanda K. Beck. Philadelphia: Saunders, 1932. 354 pp. Price, $1.50.

PROSPECTING FOR HEAVEN. Some Conversations about Science and the Good Life. By Edwin R. Embree. New York: Viking Press, 1932. 185 pp. Price, $1.75

NEWS FROM THE FIELD

It will be appreciated if readers will send to this department such items of news interest concerning public health activities as they consider suitable.

REORGANIZATION OF ITALY'S NATIONAL BUREAU OF MATERNAL AND CHILD WELFARE

THE National Bureau of Maternal and Child Welfare of Italy has recently been reorganized on the basis of 5 years' experience. In the decree on reorganization it was pointed out that the work of the bureau is not to provide relief, but to help the needy through moral and material means to become self-supporting and capable of living in society.

The new plan aims to provide a uniform well coördinated method of maternal and child welfare work instead of the present disorganized and diversified system, to establish maternal and child welfare agencies even in the remote rural districts, and to introduce trained and paid welfare workers instead of the volunteers by which most of the work of the bureau has been done so far.

The provincial branches, heretofore each in charge of a council and committee of volunteers, will now be conducted by paid directors, experienced in maternal and child welfare work and in administrative matters. The technical specialized organ of the provincial branch, heretofore lacking, will be the office of social work (social secretariat), which will organize new welfare agencies and will supervise and coördinate all the work in the province. The actual work of the provincial branch will be done by new agencies called "centers of assistance to mothers and children." Each province will be divided into urban and rural districts, in each of which such a center will be established. The work of the center will be carried out mainly by a social-service office and a clinic for mothers and children. The social service office will do case work.

The clinic will not be for the purpose of treatment, but for the purpose of teaching the mother proper care of herself and her child, with a view to prevention of illness. In those rural districts where it would not be feasible to organize stationary centers, their work will be done by traveling centers. To each clinic there will be attached a day nursery for children between the ages of 3 months and 3 years and a dining room for mothers. Day nurseries for children 3 to 6 years of age must be established in children's institutions which are already in existence.

The regulations also provide for the employment of social workers both in urban and rural localities, and for the establishment without delay of courses for the training of officials and subordinate employees. According to the latest information, such courses have been established already in two cities.

The bureau is maintained by appropriations from the national treasury and by private contributions.—*Maternità ed Infanzia,* Rome, May and June, 1932; *Rassegna della Previdenza Sociale,* Rome, June, 1932.

HADASSAH

THE eighteenth annual meeting of the Hadassah National Women's Zionists organization was held in New York September 19–20. Dr. Haim Yassky, Director of Hadassah medical activities in Palestine, described the work being done there. Since 1925, largely through its efforts, infant mor-

tality has been reduced from 53.5 per 1,000 to 22.1 in 1931.

Dr. Nathan Ratnoff, chairman of the American Jewish Physicians' Committee, announced this committee's coöperation with Hadassah in the establishment of a medical center in connection with the Hebrew University of Palestine.

Prof. C.-E. A. Winslow, of Yale University, was one of the speakers.

NURSING CALENDAR FOR 1933

THE National League of Nursing Education is presenting a hanging calendar of quotations which will make an appropriate gift. The title is "Quo Vadis?" and the cover page is from a painting by H. Willard Ortlip, who painted the cover for the Florence Nightingale calendar. The price of the calendar will be $1.00 per single copy and $.75 per copy for quantities of 50 or mor.e—National League of Nursing Education, 450 Seventh Avenue, New York, N. Y.

HOSPITAL INSURANCE IN DALLAS

THERE are two hospital-insurance plans now operating successfully in Dallas, Tex., where the Baylor and Methodist Hospitals have separate contracts with several thousand employed persons.

For the payment of $.50 a month, the hospital agrees to provide, without extra charge, hospital service when needed for a period not to exceed 21 days during a 12-month interval. After 21 days the beneficiary is given a one-third discount on regular and special hospital services required during an illness.

Contagious, tuberculosis, and mental cases are not included in the benefits after they have been diagnosed as such. Obstetrical cases are granted 50 per cent discount on hospital services.

The financial experiences of the Baylor and Methodist Hospitals indicate that the plans in effect are actuarily sound. In one hospital the average receipts per patient-day of care were $6.60, in the other $7.60. It was found that approximately 10 per cent of the members used the service a year, and that the average length of stay was approximately 9 days. Both of the Dallas hospitals are convinced that the total revenue from these members is greater than would have been paid by the individual patients on a private-fee basis for hospital service.

C. Rufus Rorem, of the staff of the Committee on the Costs of Medical Care in his book, *The Crisis in Hospital Finance,* states that voluntary sickness insurance on a group basis is steadily growing in favor.

IOWA ASSOCIATION MEETING

THE Iowa Public Health Association held its annual meeting in Des Moines October 6–7. Among the topics considered were: "The Veterinarian's Interest in Public Health," "The Building and Maintenance of Swimming Pools," and "Energy Cost of Work in Normal Children."

REPORTING OF THE BIRTHS OF DEFORMED CHILDREN IN ITALY

A LAW of May 16, 1932, requires every physician or midwife attending the birth of a deformed child to report the fact to the local mayor or health officer.

According to the same law any physician who in treating a patient notices symptoms that are causing or may cause in the future inability, even if partial, to work for a living must report the fact to the previously mentioned authorities. Fines are prescribed for violations.—*Gazetta Ufficiale,* Rome, June 11, 1932.

PERSONALS

DR. FRANK M. LAWSON, of Willows, has been appointed Health Officer of Glenn County, Calif., succeeding the late Dr. Samuel Iglick. Dr. Thomas H. Brown succeeds Dr. Iglick as Health Officer of Orland, Calif.

DR. DAVID M. KINDOPP replaces the late Dr. Charles J. Durand as Health Officer of Colfax, Calif. Dr. Kindopp is also Health Officer of Placer County.

DR. LOUIS L. ROBINSON has been appointed Health Officer of the recently incorporated city of Fairfax, Calif.

DR. EUGENE N. NESBITT, of Grand Rapids, Mich., has been appointed Director of City Welfare. He will continue his duties as superintendent of the city tuberculosis hospital.

DR. OLLIE M. GOODLOE, F.A.P.H.A., of Louisville, Ky., has been appointed to succeed Dr. Sam R. Page as Health Officer of Breathitt County, Ky.

DR. GRADIE R. ROUNDTREE, of Horse Cave, is the New Health Officer of Adair County, Ky.

DR. CHARLES FRED BLANKENSHIP, of Hawesville, has been appointed Health Officer of Hancock County, Ky.

DR. CARL N. GAMBILL, member A.P.H.A., of Salyersville, succeeds Dr. Miriam Marting as Health Officer of Greenup County, Ky. Dr. Marting recently resigned.

DR. ARTHUR J. REVELL, of Arma, became Health Officer of Cherokee County, Kans., on September 1, succeeding Dr. Clarence R. Hepler, who has accepted a similar position in Sedgwick County, Kans.

DR. HARRY C. HUMMELL has been announced as the new Deputy Health Officer of Rochester, N. Y., to succeed Dr. Arthur M. Johnson, who recently became Health Officer on the retirement of Dr. George W. Goler.

DR. C. L. OUTLAND, member A.P.H.A., who has served as Chief Medical Inspector in charge of contagious diseases for the Richmond City Bureau of Health for the past 6 years, has been appointed Medical Director of the Public Schools of Richmond, Va., succeeding Dr. N. T. Ennett who resigned.

MAGNUS W. ALEXANDER, member A.P.H.A., died September 10, at the age of 62. He was formerly connected with the General Electric Company, held the post of chairman of the Massachusetts Commission on Old Age Annuities and Pensions, and was a member of the Commission on Compensation for Industrial Accidents in Massachusetts. He was the author of the book *Safety in the Foundry*, as well as many articles on economic subjects. Mr. Alexander headed the National Industrial Conference Board since its organization in 1916.

CONFERENCES

November 4, New York State Association of Public Health Laboratories, Albany, N. Y.

November 6–11, Fifteenth Annual Convention, American Dietetic Association, New York, N. Y.

November 11–12, Third Biennial Conference of the National Council of Parent Education, French Lick Springs, French Lick, Ind.

November 14–16, Southern Branch A. P. H. A., Birmingham, Ala.

November 14–16, Southern Medical Association, Birmingham, Ala.

November 14–16, National Malaria Commission, Birmingham, Ala.

November 14–18, Tenth Annual Short School, Texas Public Health Association, Dallas, Tex.

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